THE IRON TRADE REVIEW

VOLUME XXXIX CLEVELAND, NOVEMBER 1, 1906 NUMBER 44

IRON IMPORTATIONS

BEGIN ON EXTENSIVE SCALE AND SELL READILY.

High Prices For Quick Deliveries—Record Ore Movement—Recent Advances.

The trend of the pig iron market continues upward and the situation is increasingly grave. Prices for the first half have established themselves on a higher level and for prompt delivery No. 2 foundry, $25 has been paid in various centers. The first extensive importation of foreign irons has been begun through the shipment of about 30,000 tons of Middlesborough iron, the first two cargoes of which sold before its arrival at about $21.50 on dock. Some of it will go as far west as the central states, though most will remain at the coast. Foreign markets are rising, however, and no great measure of relief is promised from that direction. The week has witnessed some considerable sales of domestic iron, notably 11,000 tons of Bessemer for first half delivery at slightly higher than $21. valley, 35,000 tons of malleable Bessemer for delivery during the last nine months of 1907 at about $21 Chicago, and 50,000 tons in scattered lots in the east. The brightest feature of the situation is the fact that apparently these extremely high prices are not affecting consumers generally, and that uncovered requirements of the immediate future do not aggregate any very large tonnage. The price of ferro-manganese has risen sharply.

Advances are Well Received. The predicted advance in sheets, tin plate and roofing by the leading producer has become effective and is being well received. A straight $2 advance has also been made on all black and galvanized gauges shipped from warehouse stocks. The expected advance in hoops did not materialize. Contracts for plates for eight freighters have been announced, and structural operations involving large tonnages have been contracted for. The demand for crude steel continues insistent and a sale of 1,800 tons of open-hearth billets at $31.50 delivered Pittsburg is noted, this being the high record of the present season. The leading producer has advanced iron bars to 1.70c Youngstown, and heavy sales have been made to car builders. The report of the Steel Corporation, showing unfilled orders at the close of the last quarter to be the largest since its organization, is an accurate index to present conditions in the industry.

Ore Movement Still Heavy. The October movement of ore from upper lakes has been the heaviest in history, and with even fairly favorable conditions up to the close of navigation the season's shipments will be in the neighborhood of 37,000,000 tons, or about 3,500,000 in excess of the record set in 1905. So far the selling of ore for next season has been confined to one interest, but it is now generally admitted that the advance which it is securing, 75 cents on Bessemer and 50 cents on non-Bessemer over 1906 prices, will prevail when the general selling movement is begun.

Coke Market Less Excited. It now appears that independent consumers of coke are better supplied than has been believed, and there has been a distinct lull in the market following the heavy purchases by Frick interests. In the east, however, there is still considerable activity, and certain large producers are withholding quotations for the present. There is little change in the car situation, and considerable suffering is experienced in the coke region. In certain pig iron centers improved service is reported.

RECORDS BROKEN

BY STEEL CORPORATION DURING THE THIRD QUARTER.

Net Earnings and Volume of Unfilled Orders Heaviest in History.

New York, Oct. 31.—Directors of the United States Steel Corporation at a meeting concluded late Tuesday, declared the regular quarterly dividend of ½ of 1 per cent on common stock and 1¾ per cent on preferred. For the quarter ending Sept. 30, total net earnings, after deducting expenditures for ordinary repairs, renewals and maintenance of plants, employes' bonus funds, interest on bonds and fixed charges of the subsidiary companies were $38,114,624. By months the net earnings were: July, $12,242,098; August, $13,158,860; September, $12,713,666. This is the heaviest third quarter in the history of the corporation, the nearest approach to this record being in 1902 when net earnings were $36,945,489.

The item of net earnings was reduced to the extent of $7,633,912 by appropriation for the depreciation and reserve funds, for sinking funds on bonds of subsidiary companies and for a special movement and replacement fund of $1,000,000. Further deductions included an item of $6,936,963 for interest on bonds outstanding and sinking fund provisions and dividend payments of $8,846,431. "On account of expenditures made and to be made on authorized appropriations for additional property, construction and discharge of capital obligations" $11,000,000 was charged off, leaving the balance of surplus for the quarter $3,697,318.

The volume of unfilled orders on hand Sept. 30 was 7,936,884, the largest in the history of the corporation, exceeding the record of Dec. 31, 1905, when the tonnage was 7,605,086 tons.

At the close of the meeting Judge Gary said that $3,475,000 had already been expended at Gary, Ind., and that $18,524,436 had been set aside for work next year. He stated that he hoped the corporation would be able to make steel there by the spring of 1908.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Considerable Tonnage of Bessemer Sold.—Some Price Advances.

Office of THE IRON TRADE REVIEW, 521 PARK BUILDING, Oct 31.

While not particularly active, the week under review found the market strong and with an advancing tendency, this being true of coke, pig iron and iron bars on one hand and of sheets, tin plate and roofing on the other. An advance in hoops was expected, but did not materialize. Heavy new business is being booked in steel bars, some of it at advanced prices, and contracts for plates for eight lake freighters have been announced. In structural lines the contract by the Standard Steel Car Co., with the McClintic-Marshall Co. for 4,000 tons for its new plant at Hammond, Ind., and material for the City Investment building, New York, for approximately 14,000 tons by Post & McCord, of New York, were the chief items of interest.

The announcement last week that the Bessemer plant of the Carnegie Steel Co. at its Duquense works would be abandoned and open-hearth furnaces installed in its stead and that two additional blast furnaces would also be erected there has caused considerable speculation but no further details are forthcoming.

Pig Iron.—The largest sale, and in fact the only one of any considerable tonnage during the week, was that of about 11,000 tons of Bessemer pig iron for first half delivery at an average of higher than $21, valley, to a maker of ingot molds. For spot delivery 1,000 tons of gray forge iron sold at $21.80 delivered Pittsburg. A small tonnage of northern No. 2 foundry for prompt delivery sold at $23.50, furnace, and $20, valley, is quoted for first half of next year. There have been several inquiries in the market for Bessemer and foundry iron, and apparently there are quite a few interests which have not covered for their requirements and are now anxious to get in. Southern No. 2 for prompt delivery is quoted $20, Birmingham, equal to $24.60, Pittsburg, and for second quarter of next year $17.50, Birmingham, is quoted by a large interest, no quotations being made on first-quarter. On first half delivery we quote the following nominal prices:

Bessemer Valley	21.00 to 22.00
Bessemer, Pittsburg	21.85 to 22.85
No. 1 Foundry, Pittsburg	21.35 to 21.60
No. 2 Foundry, Pittsburg	20.85 to 21.10
Gray Forge, Pittsburg	19.85 to 20.10
Basic, Valley	20.75 to 21.00
Basic, Pittsburg	21.60 to 21.50

Ferro-Managanese. — Prices have shown a material advance during the week and on the good grades of imported 80 per cent ferro-manganese $85 is procurable for both prompt and future deliveries. Ferro-silicon, 50 per cent, is quoted $110 for the remainder of the year and on the 12 per cent domestic grade at $34.

Steel. — We note the sale of 1,800 tons of open-hearth billets at $31.50, delivered Pittsburg, during the past week, by a broker. This is the high mark during the present scarcity of semi-finished steel. Local mills are practically out of the market and prices quoted by them are but nominal as they would not accept business calling for deliveries during the remainder of the year. Bessemer billets, 4 x 4, are quoted nominally at $28 to $29 with no offerings, and open-hearth at $29 to $30, with sheet and tin bars at the usual differential. With the return of cold weather larger productions are expected and as mills usually try to make record runs in October, the month just closed is expected to show many production records smashed, but as yet no figures upon which to base a prediction are available. Finishing mills are having difficulty in obtaining steel for their requirements and producers are endeavoring to cut down specifications to the lowest possible tonnage.

Skelp.—In most cases skelp is taking the plate schedule on new contracts but there has been very little new business placed, consumers having contracted heavily earlier in the year and now specifying freely against these contracts. We quote as follows: Bessemer, grooved, 1.65c to 1.70c; sheared 1.70c to 1.75c; basic, grooved, 1.75c to 1.80c; sheared, 1.80c to 1.85c; iron skelp, 1.85c to 1.90c; sheared, 1.95c to 2c.

Muck Bar. — With the prevailing high price of forge iron we quote, nominally, $33 to $34 on all pig muck bar and $30 to $31 on scrap bar. There has been but little demand, on account of contracts placed earlier in the year and the muck bar offered in the market has not been enough to fix a market.

Hoops and Bands.—The anticipated advance in price of hoops did not materialize this week, but is expected within a short time. The market is strong and pressure for deliveries heavy. We continue to quote as follows:

Hoops, in carload lots, 1.90c; in less than carload lots, 2c; bands, 1.50c base, half extras as per standard steel card. Prices f. o. b. Pittsburg.

Plates.—During the past week contracts were announced for the material for eight lake freighters, the greater part of them to be built at Chicago. The plate market is very strong and the leading interest is out of the market until after the first half of the year, as far as new business is concerned. Specifications are very heavy, particularly from steel car companies, and the lake shipyards; several recent big structural contracts carry with them a good tonnage of plates. We quote:

Tank plate ¼-inch thick, 6¼ to 100 inches, 1.60c f. o. b. mill, Pittsburg. Light plate schedule, No. 10, 1.70c; Nos. 11-12, 1.75c; Nos. 13-14, 1.80c; Nos. 15-16, 1.90c. Extras on the regular plate schedule are as follows per 100 pounds: boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates, varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; complete circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gauges under ¼-inch to and including 3-16-inch plates on thin edges, 0.10c; under 3-16 inch to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets. — Effective October 25, the leading interest has announced an advance of 0.10c on black and galvanized sheets, and 10c per square on painted and galvanized roofing and 0.10c on blue annealed sheets. The continued scarcity of semi-finished steel has made it impossible to catch up on deliveries which average ten to eleven weeks. We quote the advance as follows:

Black steel sheets, one pass, cold rolled: Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; Galvanized, Nos. 10-11, 2.55c; Nos. 12-14, 2.65c; Nos. 15-16, 2.75c; Nos. 17-21, 2.90c; Nos. 22-24, 3.05c; Nos. 25-26, 3.25c; No. 27, 3.45c; No. 28, 3.65c; No. 29, 3.90c; No. 30, 4.15c. Corrugated roofing, $1.85 per square for No. 28 painted, 2½ inch corrugation and $3.15 per square No. 26 galvanized, 2½ inch corrugation. Blue annealed sheets, No. 10 and heavier 1.80c; Nos. 11-12, 1.85c; Nos. 13-14, 1.90c; Nos. 15-16, 2c.

Rails and Track Material.—There has been a large inquiry for both light and standard sections, but the actual

business placed during the week with local mills has been light. With the business already taken and with the tonnage that will be carried over into next year, the aggregate will reach the capacity of mills for the first six months of 1907. The spike market is very strong and $2.50 to $2.75 is quoted for future deliveries and $3 for near by shipment. We quote:

Fifty pounds and heavier, 500-ton lots and over $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds, $32; 20 pounds, $33; 25 pounds to 45 pounds, $31 to $32; angle bars for standard sections, 1.50c; spikes, $2.50 to $2.75 for forward deliveries.

Tin Plate.—The leading interest on October 25 announced an advance of 15c per base box on tin plate. We quote as follows:

Coke tin plates, 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less two per cent for cash in 10 days.

Merchant Bars. — The demand for both iron and steel bars has been very heavy during the week under review, and iron bars have advanced in price, the leading producer now quoting 1.70c base Youngstown. While the leading producer of steel bars and the largest independent interest are still quoting 1.50c base Pittsburg, other interests are quoting 1.60c Pittsburg. During the week 8,500 tons of common iron bars were sold at 1.70c, Youngstown, for shipment into the Pittsburg district, and 1.60c is quoted by central western mills for iron going west. If western iron comes east the buyer pays the difference between the Pittsburg freight and freight from point of shipment. The same interest sold 3,000 tons of steel bars at 1.60c, Pittsburg. New business in steel bars is still in excess of production. We quote as follows:

Common iron bars, 1.70c Youngstown in carload lots, 1.75c in less than carloads; Bessemer steel bars, 1.50c; plow and cultivator, 1.50c net; channels, angles, zees and tees, under three inches, 1.60c, all f. o. b. Pittsburg. The following diffferentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds, of a size, 0.30c advance.

Wire and Wire Nails.—Prices are firm and a large amount of business is being placed, there being a big demand for all kinds of wire products. The car situation is delaying deliveries and mills are going behind on shipments. We quote:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carload lots, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing, plain wire, $1.70 to jobbers and $1.75 by carload.

Merchant Steel. — The volume of business for shafting and machinery steel has been heavy and premiums are commanded for prompt deliveries in many instances, although the large producers are caring for their old customers at the regular prices. We quote:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch, 1.65c base half extra tire list. Iron finished tire 1½ inch by ½ inch and over to be sold on regular bar basis of 1.50c base; half extra steel card.

Merchant Pipe. — The recent advance has not affected the volume of business being offered mills and while the past week has not brought out any large line pipe contracts, there has been a fair number of small orders for a few miles each. Deliveries are far behind and mills are loaded up for a considerable time ahead. We quote:

	Steel		Iron	
	Black	Galv.	Black	Galv
⅛ to ¼ inch	69	53	65.5	49.5
⅜ inch	71	57	65.5	49.5
½ inch	73	61	68.5	57.5
⅝ to 6 inches	77	67	73.5	63.5
7 to 12 inches	72	57	69	54
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	62	50	58.5	46.5
½ to 4 inches	69	57	65.5	53.5
4½ to 8 inches	65	53	61.5	48.5
Double extra strong plain ends, ⅛ to 8 inches	58	47	53.5	42.5

Boiler Tubes.—There has been a strong and steady demand for merchant boiler tubes and we quote the following official discount for consumers, jobbers' discounts being 79 basing, base sizes, and 5:

Boiler tubes.	Steel	Iron
1 to 1¼ inches	50	45
1½ to 2¼ inches	62	45
2½ inches	64	50
2¾ to 5 inches	70	57
6 to 13 inches	62	45

Less than carloads two points less.
2½ inches and smaller, over 18 feet, 10 per cent. net, extra.
2¾ inches and larger, over 22 feet, 10 per cent. net, extra.

Structural Material. — Post & McCord, of New York, have secured the contract for the new City Investment building, New York, and placed contracts for 14,000 tons of structural material. The Standard Steel Car Co. has placed with the McClintic-Marshall Construction Co., contract for the erection of its new car works at Hammond, Ind., requiring about 4,000 tons of material. With a slightly decreasing demand delivery promises are getting better. We continue to quote:

Beams and channels, 15-inch, and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Old Material.—One or two fairly large transactions have been put through during the week, and there has been a slight advance in foundry and rolling mill scrap. We quote as follows: Heavy melting scrap $17 to $17.50; rerolling rails, $19 to $19.50; bundled sheet scrap, $14.75 to $15.25; iron car axles, $29 to $30; old car wheels, $20.50 to $21; old iron rails, $24 to $25; low phosphorus scrap, $22 to $22.50; No. 1 wrought scrap, $19.50 to $19.75; machine shop turnings, $13.25 to $13.50; axle turnings, $13.50 to $13.75; cast borings, $10.50 to $11.50; No. 1 cast scrap, $17.50 to $18.

Coke.—The coke market has been comparatively quiet during the past week and the heavy buying for next year has taken a lull after the big operations of the past two weeks. The independent consumers have been active in securing coke to cover their requirements and producers are asking higher prices. We quote the good grades of furnace coke for spot shipment $3 to $3.10 and for the first six months of next year $3.15 to $3.25. For the 12 months of next year $3 to $3.10 is quoted. On standard 72 hour foundry coke we quote $3.85 to $4, ovens.

CHICAGO.

Pig Iron Situation More Acute.—Car Shortage Threatens Trouble.

Office of THE IRON TRADE REVIEW,
1362 MONADNOCK BLOCK, Oct. 30.

Conditions grow more acute in pig iron. The market continues to advance and a state of affairs akin to a panic exists among foundrymen who are short of metal. Contract deliveries are very irregular, due to the scarcity of cars, and the demand for spot iron becomes more insistent. Inquiry for round lots is increasing and one transaction involving 30,000 tons of malleable Bessemer was consummated in the week under review. Advances in finished materials include $1 on blue annealed sheets, $2 on box annealed, $2 on galvanized sheets, $3 on tin plate, $2 on terne plate, 10 cents a square on painted corrugated roofing, and five cents a square on galvanized corrugated roofing. Iron and steel bars are also active, though western makers are not able to secure as good prices for these products as are obtained in the east. The Illinois Steel Co. is rapidly overtaking its de-

ferred tonnage and on structural steel can give immediate rollings. A month ago the company had shipping instructions in hand for approximately 450,000 tons. This month specifications have fallen off 25,000 tons by reason of the fact that railroads specified in September for their entire rail requirements for the balance of the year, so with an increase of 25,000 tons in steel output available, it expects to materially diminish the deferred tonnage before the end of the year. Tubular goods continue active and an advance is soon expected in boiler tubes. The principal inquiry is for 2,500 tons of cast iron pipe for the Northern Pacific. This railroad has also placed contracts with the American Bridge Co. for 16,000 tons of fabricated bridge material and is said to be negotiating for 8,000 tons additional. The scarcity of cars is delaying shipments of finished material from local mills. The Illinois Steel Co. may have to shut down its structural mill unless an improvement in this respect is made soon as it is accumulating a large tonnage of structural material in its yards for want of cars to distribute it.

Pig Iron.—Keen competition exists among foundrymen to obtain desirable deliveries of pig iron and this rivalry is forcing prices to a dangerous level. As high as $21.50, Birmingham, has been paid for spot shipment of southern No. 2, and $25, Chicago, is asked for the same grade of northern iron. Prices for the first half have advanced another 50 cents a ton, and contracting for this delivery is increasing. The market is very panicky and the end of the upward movement is not yet in sight. The principal transaction of the week was the sale of 35,000 tons of malleable Bessemer to a car wheel interest at a price around $21, Chicago, the deliveries running through the last nine months of the year. All malleable quotations have since been withdrawn and future transactions will be handled on their individual merits, according to the condition of the furnace. Lake Superior charcoal has advanced 50 cents to $1.00 a ton, spot shipment now commanding $23.50, Chicago. High silicon irons are in strong demand and very scarce due to the increasing use of cast scrap. One sale of 200 tons of southern five per cent silicon was made at $26.90, Chicago, while another furnace quoted $28.65, Chicago, on an inquiry for four per cent silicon. Jackson county eight per cent to ten per cent is held at $29.30 to $30.30, Chicago, and is almost unobtainable at these prices. Southern schedules for the first half differ widely. Virginia furnaces are asking on the basis of $19.75, Birmingham, for No. 2 foundry, or $24.15, Chicago, for the first quarter, and $23.65 for the second quarter. Quotations among Birmingham producers range from $18 to $19 for the first quarter and $17.50 to $18 for the second quarter. There is no longer any fixed spread between grades, these having been wiped away in the insatiable demand for iron. Gray forge is now held at $17 Birmingham.

Lake Superior charcoal	$22.50 to 23.00
Northern Foundry No. 1	22.50 to 23.00
Northern Foundry No. 2	22.00 to 22.50
Northern Foundry No. 3	21.50 to 22.00
Northern Scotch Foundry	22.50 to 23.00
Ohio Strong Softeners No. 1	23.30 to 23.80
Ohio Strong Softeners No. 2	22.80 to 23.30
Southern Foundry No. 1	21.90 to 22.40
Southern Foundry No. 2	21.40 to 21.90
Southern Foundry No. 3	20.90 to 21.40
Southern Foundry No. 4	20.40 to 20.90
Southern No. 1 Soft	21.90 to 22.40
Southern No. 2 Soft	21.40 to 21.90
Southern Gray Forge	20.90 to 21.40
Southern Mottled	20.40 to 20.90
Southern Silveries (4 per cent to 6 per cent Silicon	26.40 to 27.40
Jackson Co. Silveries, 8 to 10 per cent Silicon	29.30 to 30.30
Alabama and Georgia Car Wheel	28.40 to 28.90
Malleable Bessemer	22.50 to 23.00
Standard Bessemer	23.80 to 24.80

Billets.—Demand for steel remains insistent. The local market is inactive, however, because of the inability of western mills to make the required deliveries. Inquiries for 1907 shipments continue numerous, and more or less tonnage for that delivery is constantly being booked. Forging billets are held firmly at $36 Chicago for prompt shipment, and $34 to $35 for forward deliveries

Iron and Steel Bars.—Bar iron is the most active of the two products, and on the basis of 1.55c to 1.60c Pittsburg a considerable tonnage is being closed. Sales of steel bars are reported in eastern territory at 1.60c by independent mills, but nothing at this price has been taken out here. Specifications for both materials continue very heavy. Shipments are still very slow, and because of this fact, entailing great difficulty in replenishing stocks, local jobbers have found it necessary to readjust their store prices on steel shapes. Formerly 1.85c was the base price, but this has been raised to $2.00. We quote carload lots, mill load lots, mill shipments, as follows:

Bar iron 1.71½c, soft steel bars and bands, 1.66½c, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 2.06½c base, full extras; old rail stock, 1.65½c. We quote bar iron from stock, 2.20c, full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛ inch and larger, $2 per 100 pounds base; 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $1.85 to $1.95 half extras; soft steel hoops, $2.30 to $2.40 full extras. Other sizes not mentioned above, $2.00 per 100 pounds base plus half extras.

Structural Steel.—The Illinois Steel Co. has caught up on its contract deliveries of structural steel and can now give immediate rollings on new specifications. New tonnage is in light volume, and specifications show a decrease. The principal contract closed in the week under review was taken by the American Bridge Co. from the Northern Pacific railway, and was for 16,000 tons of fabricated bridge material. The same company also secured contracts for the erection of the First National Bank, Cheyenne, Wyo., 100 tons, and for the erection of a cavalry drill hall at Fort Snelling, Minneapolis, 135 tons. We quote mill prices as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from that city to Chicago is 16½c per 100 pounds. Quotations from store are as follows:

All angles, three inches and larger, including six inches, $2.05 to $2.10 per 100 pounds; angles over six inches, $2.15 per 100 pounds base; beams, three inches to 15 inches inclusive, $2.05 to $2.10 per 100 pounds base; channels, three inches and larger, $2.05 per 100 pounds base.

Merchant Steel. — Specifications continue to the limit of producers' output. New tonnage is light resulting from the fact that all makers are out of the market Prices are without change as follows:

Planished or smooth finished tire steel, 1.86½c; iron finish, up to 1½ x ½ inch, 1.81½c; iron finish, 1½ x 1½ inch and larger, 1.66½c, base; channels for solid rubber tires, ¾ to 1 inch, 2.16½c, and 1⅛ inch and larger, 2.06½c; smooth finished machinery steel, 1.91½c; flat sleigh shoe, 1.71½c; concave and convex sleigh shoe, 1.96½c; cutter shoe, 2.35c; toe calk steel, 2.21⅛c; railway spring, 1.86½c; crucible tool steel, 6½c to 8c, and still higher prices are asked on special grades. Shafting, 50 per cent off in car lots and 45 per cent in less than car lots, in base territory.

Sheets.—Effective Thursday, October 25, the American Sheet & Tin Plate Co. announced the following advances: $1.00 a ton on blue annealed sizes; $2 on box annealed; $2

on galvanized sheets; $3.00 on tin plate; $2 on terne plate; 10c a square on painted corrugated roofing and 5c a square on galvanized corrugated roofing. It is to be noted, however, that the leading interest has not withdrawn the $1.00 rebate, and this will be continued, it is said, on season contracts. Jobbers made no change in their prices on the occasion of the advance in sheets last June, but since that time demand has grown so insistent and deliveries have become so hard to obtain that they have deemed it a necessity to depart from this attitude. The mill advance, therefore, has been made the occasion of a straight $2 advance on all black and galvanized gauges shipped from warehouse stocks. We have revised our prices, and quote as follows: Black sheets, Nos. 8, 9 and 10, 1.85c Pittsburg; No. 28 gauge, 2.60c Pittsburg. Galvanized sheets No. 28 gauge, 3.65c Pittsburg. Freight to Chicago 16½c per 100 pounds. Jobbers' prices on less than carload lots from store are as follows: Black sheets, No. 10, 2.20c to 2.30c; No. 12, 2.25c to 2.35c; No. 14, 2.30c to 2.40c; No 16, 2.40c to 2.50c; Nos. 18-20, 2.70c to 2.80c; Nos. 22-24, 2.75c to 2.85c; No. 26, 2.80c to 2.90c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c; No. 30, 3.35c. Galvanized sheets, Nos. 10 to 20, 3.25c to 3.35c; Nos. 22 and 24, 3.40c to 3.45c; No. 26, 3.60c to 3.70c; No. 27, 3.80c to 3.90c; No. 28, 4c to 4.10c; No. 30, 5.20c to 5.30c.

Plates.—There is a good movement in specifications and new tonnage for sheared plates. Universal sizes are also in active demand. On the former material, however, mills are congested with orders, the best delivery obtainable being ten to twelve weeks. Prices are very firm, but without change. We quote as follows.

Tank steel, ¼-inch and heavier, up to 100 inches wide, 1.60c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago is 16½c per 100 pounds.

Jobbers' prices for shipment from local stocks are as follows: Tank steel ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches up to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch, 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.15c to 2.25c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Insistent demand for track supplies is felt by all manufacturers. Early shipments are hard to obtain, and for guaranteed deliveries as high as 3c per pound has been paid for spikes. Light rails are firm in price and orders are being taken for deliveries running into the first half of 1907. We quote as follows:

Bessemer rails, $28 and open-hearth $29; light rails, Bessemer steel, 30 to 45-pound sections, $31; 25-pound, $32; 20-pound, $33; 16-pound, $34; $12-pound $35, and lighter sections, down to 8-pound, $41.50 all f. o. b. mill.

On contracts for angle bars, spikes and bolts when accompanied by rail orders, the following quotations are in effect: 1.50c to 1.75c for angle bars, 2.10c to 2.25c for spikes, and 2.45c to 2.55c for bolts. On miscellaneous business from the general trade, however, other manufacturers are asking 2.50c Chicago, for spikes, 2.85c for bolts with square nuts, and 3c for bolts with hexagon nuts. Angle bars are held at 2.25c to 2.75c, according to the tonnage and delivery required.

Cast Iron Pipe.—The only transaction of interest pending is the inquiry from the Northern Pacific for 2,500 tons of culvert pipe. The Great Northern is also expected in the market within a few weeks for a round tonnage. Prices are without change, as follows: Four-inch water pipe, $34; six, eight and ten-inch, $33; 12-inch and larger, $32; gas pipe, $1.00 a ton higher.

Merchant Pipe.—Specifications are very heavy and deliveries slow as a result of congested order books and scarcity of cars.

Prices are firmly maintained. We quote, Chicago discounts in car lots, as follows: ¾ to six-inch black steel pipe, 77.35; galvanized, 67.35. From store in small lots, Chicago jobbers quote 74½ to 75 per cent discount on the base sizes.

Boiler Tubes.—The market is very firm and local jobbers anticipate an early advance. New tonnage and specifications continue in good volume. We quote as follows: 2¾ to five inches, steel, 68.35; iron, 55.35; seamless, 2¾ to 4½, 50.85. Less than carload lots from store, base sizes, are 60 off for steel; 47½ for iron and 42½ for seamless tubes.

Wire Products.—The labor scarcity and shortage of cars continue potent factors in preventing mills from overtaking specifications. Even with these drawbacks, production has increased over that of September, but this advantage is more than offset by a proportionate increase in specifications. Prices are firm as follows:

Wire nails, $2; painted barbed wire, $2.15; galvanized barbed wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.15; galvanized staples, $2.40. Carload lots to retailers, five cents higher; less than carload lots, 15 cents higher.

Coke.—The large purchases made by the Steel Corporation through the Frick Coke Co., in the last two weeks, are not reflected by increased demand from western consumers. Practically the entire trade in the west, furnace and foundry, covered some months ago for a large porportion of their requirements in 1907. Such demand as is now felt is for "filling-in" lots for immediate shipment. Prices have stiffened as a result of the active buying in the east, and 72-hour Connellsville brands are firm at $3.75 to $4 ovens, and furnace coke from $3.25 to $3.50. Wise county coke is held at $3.75 to $4.00 ovens. Local by-product coke is strong at $6.40 Chicago.

Old Material.—The scrap market grows in strength daily. All the railroad lists mentioned last week were disposed off at good prices, the 2,500 car wheels offered by the Rock Island being sold at around $22 Chicago. Cast scrap is in exceptionally good demand, and being somewhat scarce prices are very stiff. Steel and wrought iron users are buying more freely and are less disposed than formerly to quibble over prices if satisfactory deliveries can be given. Our prices are as follows, gross tons being given in the first paragraph:

Old Steel Rails (4 feet and over)	$17.50 to 18 00
Old Steel Rails (less than 4 feet)	17 50 to 18 00
Old Car Wheels	21.50 to 22.00
Old Iron Rails	25 50 to 26.00
Relaying Rails, subject to inspection	28.00 to 30.00
Frogs, Switches and Guards	17.50 to 18.00
Heavy Melting Steel	16.50 to 17.00
Mixed Country Steel	14.50 to 15.00

We quote net tons, as follows:

No. 1 R. R. Wrought	$17.50 to 18.00
No. 2 R. R. Wrought	16.50 to 17 00
Shafting	18.50 to 19.00
Dealers' Forge No. 1	13.00 to 13.50
Wrought Pipe and Flues	12.25 to 12.75
No. 1 Cast, 150 pounds and less	16.00 to 16 50
No. 1 Mill	9 00 to 9 50
Mixed Busheling (No. 1 & No. 2)	12.00 to 12.50
Country Sheet	8.00 to 8.00
No. 1 Boilers Cut	11.50 to 12.00
Boiler Punchings	15.00 to 15.50
Iron Car Axles	24.75 to 25 00
Steel Car Axles	20 50 to 20 75
Iron Axle Turnings	10.00 to 10 50
Cast Borings	8.50 to 9.00
Mixed Borings, etc	8.50 to 9.00
Machine Shop Turnings	10.00 to 10.50
Railroad Malleable	15.50 to 16.00
Agricultural Malleable	15.00 to 15.50
Stove Plate and Light Cast Scrap	13.00 to 13.50
Old Iron Splice Bars	20.00 to 20.50

CLEVELAND.

October Ore Movement Heavy.—One Interest Alone in Selling Ore.

Office of THE IRON TRADE REVIEW, Browning Building, Oct. 31.

Iron Ore.—Selling for the season of 1907 continues, though only by the one interest which began a fortnight

ago. It has placed a considerable tonnage on the basis of $4.75 Mesabi Bessemer, which, from all appearances, will be the prevailing rate when the active buying movement has begun. This is expected to be within a very short time, although mining interests are endeavoring to postpone it until the present season is practically over. The October movement has been very heavy and it is estimated will total in the neighborhood of 4,750,000 tons. With favorable conditions in November and December 4,000,000 additional tons will be brought down, making the total movement for the season about 37,000,000 tons, a gain of 3,500,000 tons over 1905. Considerable wild tonnage is being chartered for the final rush, for which the established rate of 75 cents prevails. Storms have interfered with shipping of the past week and some tonnage has been lost. The car supply at lower lake docks, while not all that could be hoped for, is still fairly adequate, and is considered extremely good under present circumstances.

Pig Iron.—A limited but clamorous inquiry for spot iron and a considerable demand for later delivery have established prices on a generally higher level. For the first half iron has sold locally as high as $22.50 furnace, with the actual market somewhat below that figure, especially for deliveries only during the second half. Every lot of spot iron offered constitutes the market in itself, prices ranging as high as $25, Cleveland. Foreign iron as well as southern can be delivered locally at about that figure, and this will probably not be exceeded in the near future. No basic can be discovered for delivery during any part of the first half, and practically no Bessemer is procurable. The car situation is considerably improved in most districts suffering more acutely. For the first half delivery is quoted as follows, f. o. b. Cleveland:

Bessemer	$21.50 to 22.50
No. 1 Foundry	21.00 to 22.00
No. 2 Foundry	20.50 to 21.50
No. 3 Foundry	20.00 to 21.00
No. 2 Southern	21.00 to 22.00
Gray Forge	19.50 to 20.50
Gray Forge, Southern	17.50 to 18.00
Lake Superior charcoal	21.00 to 22.00

Coke.—As the result of the excitement incident to the heavy buying by Frick interests, coke producers have generally withdrawn quotations for the present with the idea of reentering the market when conditions again become more stable. The nominal market is $3.25 for furnace coke and $4 for foundry at the ovens.

Finished Materials.—With the recently announced advance in sheets together with the action of the leading interest in raising its price on bar iron, the market situation, it is believed, has been cleared of a possibility of other advances in the near future. The high cost of raw materials has been the occasion for advancing prices in these lines, and it is believed they will be accepted without difficulty. Car building interests have bought heavily of bar iron during the week and the price of the leading interest is now 1.70 Pittsburg. Bar steel continues in good demand with deliveries further delayed. Billets are quoted at $35 Cleveland, practically a prohibitory price. Both jobbers and mills report active business in shapes and plates and other lines are of undiminished strength. A sale of spikes at above 3c is reported for prompt delivery.

Old Materials.—The market is one of activity and increasing strength, consumers being large purchasers, with prices steadily advancing. We quote Cleveland delivery, gross tons in the first paragraph, as follows:

Old iron rails	$26.00 to 27.00
Old steel rails (over 6 feet)	19.00 to 19.50
Old steel rails (under 6 feet)	18.00 to 18.50
Old car wheels	19.00 to 19.50
Steel boiler plate	15.50 to 16.00
Steel axles	22.00 to 23.00
Malleable iron (railroad)	17.00 to 17.50
Malleable iron (agricultural)	15.00 to 15.50
Heavy steel	16.50 to 17.00
Country mixed steel	14.50 to 15.00

We quote net tons as follows:

No. 1 R. R. wrought	$18.00 to 18.50
No. 1 busheling	14.75 to 15.25
No. 1 machine cast	16.00 to 16.50
Iron axles	25.00 to 26.00
Axle turnings	11.50 to 12.00
Wrought turnings (free from cast)	10.50 to 11.00
Grate bars	13.00 to 13.50
Pipes and flues	14.50 to 15.00
Tank iron	12.00 to 12.50
Hoop and band iron	9.00 to 9.50
Sheet iron	8.00 to 8.50
Wrought drillings	10.50 to 11.00
Stove plate	13.00 to 13.50
Cast borings	8.50 to 9.00

CINCINNATI.

Pig Iron Prices Continue to Advance. —Few Furnaces Quoting.

October 30.

Pig Iron.—Prices continue to advance. Spot iron is scarce and quotation irregular according to the individual views of sellers. Spot southern iron or iron for delivery over the balance of this year is quotable at $20.00 to $20.50 Birmingham for No. 2. Northern iron for any delivery this year or spot shipment is held at about $24.00 at furnace.

For first quarter delivery southern iron is becoming strained and it is difficult to find anything under $17.50 Birmingham, and northern iron is quoted at $22.00 at furnace for the second half with first quarter practically all sold up.

For second quarter there is still some southern iron to be had at $17.00 Birmingham and sales have been made at this price, but a number of the southern furnace interests are asking $17.50 for any delivery next year.

High silicon iron is higher and for 8 per cent $27.00 is demanded for this year's delivery, and $26.00 for next year, at Ohio furnace. Gray forge is in good request and has sold the past week at $18.00 Birmingham for this year's delivery.

There is considerable inquiry pending but sales agencies are unable to find furnaces that will quote on much of the business offered. The car shortage is being felt quite acutely and deliveries are slower than last week. The whole situation is assuming the appearance of repetition of the strenuous times of 1902. How much higher prices will go seems to be the question now before the trade and how long will the high prices be maintained. The situation seems to be in the hands of sellers. We hear of one sale for third quarter delivery of southern iron at $17.00 Birmingham. We quote for first quarter of next year f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$21.00 to 21.50
Southern Foundry No. 2	20.50 to 21.00
Southern Foundry No. 3	20.00 to 20.50
Southern Foundry No. 4	19.50 to 20.00
Southern Foundry No. 1, soft	21.00 to 21.50
Southern Foundry No. 2, soft	20.50 to 21.00
Gray Forge	19.00 to 19.50
Northern Foundry No. 1	23.65
Northern Foundry No. 2	23.15
Northern Foundry No. 3	22.65
Jackson County Silvery, 8 per cent	27.15
Southern Charcoal	26.00 to 27.00

Finished Material.—The market remains firm and one of the leading interests in bar iron has advanced its price to 1.70c Pittsburg, or 1.83c Cincinnati. Jobbers report a good demand from store We quote:

Bars at 1.83c, half extras, with dealers quoting 1.95c for iron and steel out of store. Galvanized sheets No. 10 and No. 12, in car lots are 2.68c. We quote black sheets, No. 27 at 2.53 in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.90c; No. 27, 2.70c; No. 16, 2.25c; No. 14, 2.20c; No. 12 2.15c. Tank plates are firm and sell out of store at 2c to 2.10c for ¼-inch and 2.10c for 3-16 Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.35c from stock and angles at 2.10c to 2.15c for base sizes.

Coke.—The market continues strong and prices are well maintained. There is some contracting still to be done by furnaces as well as foundries. Spot furnace coke is very hard to find. It is said that in the Pocahontas district the contract price for furnace coke has not been made, covering forward deliveries. Prices in the leading coke producing districts are as follows:

Wise County, Va. Furnace Coke prompt shipment	$3.25 to 3.50 per ton
Wise County, Va. Foundry Coke on contracts	3.75 to 4.00 per ton
Pocahontas Furnace Coke prompt shipment	3.25 to 3.40 per ton
Pocahontas Foundry Coke on contracts	3.25 to 3.50 per ton
Connellsville Furnace Coke prompt shipment	3.00 to 3.25 per ton
Connellsville Foundry Coke on contracts	3.75 to 4.00 per ton
New River Foundry Coke on contracts	3.40 to 3.50 per ton
New River Furnace Coke, prompt shipment	2.75 to 3.00 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.70 to $1.75 per ton on $9.00 pig iron, plus 19 to 20 per cent of the advance on pig iron above $9.00 Birmingham.

Old Material.—The market remains firm with an upward tendency and some quotations are slightly higher than a week ago. We quote f. o. b. Cincinnati.

Old No. 1 railroad wrought, net tons	$17.50 to 18.00
Cast machine and foundry, net tons	15.50 to 16.00
Old iron rails, gross tons	24.00 to 25.00
Old steel rails, gross tons	18.00 to 18.50
Old short lengths, gross tons	17.00 to 17.50
Old iron axles, net tons	23.00 to 24.00
Heavy melting scrap, gross ton	19.50 to 20.00
Stove plate, net tons	12.50 to 13.00
Wrought turnings, net tons	10.00 to 10.50
Cast borings, net tons	8.00 to 8.50
Car wheels, gross tons	17.50 to 18.50

NEW YORK.

Shortage of Foundry Iron Grows More Serious.—No. 2 Selling at $25.

Office of THE IRON TRADE REVIEW, Room 1315, No. 150 Nassau St., Oct. 29.

Pig Iron.—The situation grows more grave day by day. It is now apparent that the domestic output of pig iron is not equal to the needs of the country, and importations from abroad offer the only early relief. At the same time the prices in foreign markets are rising to meet those prevailing here and an unsatisfied demand in Belgium and Germany is also drawing heavily on English and Scotch furnaces. Today No. 2 foundry readily brings $25 throughout New England and the east, and the prediction that before spring melters will be paying $30 is received with respect if not with entire credulity. On the other hand, the sober-minded have not entirely disappeared from the market, and it is not difficult to find evidence of a tendency in some quarters to lay on lurid colors too lavishly. The unheard of prices actually paid are, however, not easily explained away.

Sales have been heavy in spite of the statements that there is no iron to sell. The total of all grades sold in the local market is not far from 50,000 tons. Future prices are almost as unstable as those of spot iron. A large block of foundry goes to central New York state for $25 per ton. Of basic 7,000 tons brought $22, delivered, and more will be sold within the next few days. A 100-ton lot of Alabama No. 2 foundry was sold several days ago at $20, Birmingham, and 200 tons of the same grade at $23.25, at the furnace in eastern Pennsylvania. Some Virginia producers are quoting $21 and $22 for first quarter at the furnace, and $19 for the second quarter. These prices were handed about today but no one expects them to last from one mail to the next.

The key to the situation is to be found in the very common failure to deliver on old contracts. Producers who are not behind in the matter of deliveries are the exception rather than the rule. It is a proud boast of one producer to say that shipments are no more than a thousand tons behind. Melters who fancied themselves secure in contracts extending months into the future and who expected to pick up a little spot iron as occasion might demand, are appearing daily, all with the same plaint, that they will be compelled to shut down unless supplies are forthcoming without delay. The fault is, however, not in all cases due to overselling on the part of the furnaces. Freight difficulties are allowing the metal to accumulate in the furnace yards, especially in the south, and inability to get supplies of ore retards production. This is the most serious factor of all, for transportation troubles are not likely to grow less during the next two months.

Prices are so irregular that quotations are difficult. The following are approximations of today's values at tidewater for future delivery.

Northern No. 1 Foundry	$23.00 to 24.00
No. 2 Foundry	22.50 to 23.50
No. 2 Plain	22.00 to 23.00
No. 1 Southern Foundry	22.00 to 23.00
No. 2 Southern Foundry	21.50 to 22.50
No. 3 Southern Foundry	21.00 to 22.00
No. 4 Foundry	20.00 to 21.00

Certificates and Contracts.—Trading on the New York Produce Exchange shows the effects of the stringency in the outside market. The market is strong with prices rapidly rising. At the same time little metal is offered and actual business very small. The prejudice against warrants does not disappear even under the stress of present circumstances. An offer of 100 tons Alabama at $20, Birmingham, today found no buyers. The following are quotations for standard foundry contracts:

Standard Foundry Contracts.

	Bid.	Asked.
October	....	....
November	....	....
December	....	....
January	22.50	23.00
February	....	23.00

Finished Iron and Steel.—Business has been active in all finished and semi-finished steel products. A very large tonnage of rails is reported sold, although no announcement has yet been made officially and in detail. Other large contracts are pending. The difficulty with rails as with all other heavy products is one of delivery, and premiums for prompt shipment are talked of freely as among the possibilities. Among the sales reported were the following: Texas Pacific, 15,000 tons; Pettibone, Mulliken & Co., 35,000; Puget Sound & Baker River, 2,700, and for export, 10,000 to 15,000 tons. Other sales are given elsewhere in the present issue.

New business in structural material has been considerable in spite of the waning building season and the proximity of the spring orders which will begin to arrive in December. The October bookings of the American Bridge Co. will be about equal to the capacity of the mills, 60,000 tons. Bookings for the current year have been remarkably uniform and large in volume. The first ten months will show about 550,000 tons and the business taken each month varies only a few hundred tons. Among the contracts secured by the American Bridge Co. during the week are 14,000 tons for the City Investment Co. building; 17,000 tons of bridge work for the Northern Pacific railroad, and 2,500 tons for the Kent avenue power house in Brooklyn. Considerable railroad bridge work still remains to be provided for, but nearly all the large contracts which have been in sight for many weeks have now been located. The largest bridge job in immediate prospect is that of the Baltimore & Ohio railroad which calls for 15,000 tons.

Steel plates are in fairly active demand, the routine requirements of ship yards, boiler makers and car builders keeping producers comfortably occupied. The bar iron situation has not materially changed. Mills are quoting $1.65 and $1.70 base Pittsburg. There was one sale of 3,000 tons.

The following are prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84½c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.41½c; refined iron bars, 1.79½c to 1.84½c; soft steel bars, 1.64½c to 1.84½c; sheets, No. 28 black, 2.60c.

Old Materials.—The market is if anything slightly more quiet than a week ago, except in the case of cast scrap, which is in active demand owing to the scarcity of pig iron. Supplies of heavy cast are fairly plentiful

but are moving fast. Consumers of heavy melting steel are buying for immediate needs and holders are not eager to sell. The demand for wrought yard scrap is comparatively light, and offers of consumers are not up to the views of holders. There was a sale of 350 tons at $22 gross tons delivered. The following are prices approximately f. o. b. tidewater:

Old iron rails	$25.00 to 25.50
Old steel rails, long lengths	16.50 to 17.00
Old steel rails, short pieces	15.50 to 16.00
Relaying rails	25.00 to 26.00
Old car wheels	18.00 to 19.00
Old iron car axles	29.00 to 30.00
Old steel car axles	20.00 to 21.00
Heavy melting steel scrap	16.00 to 17.50
No. 1 railroad wrought scrap	19.00 to 20.00
Iron track scrap	18.00 to 19.00
Wrought pipe	13.50 to 14.00
Cast borings	11.00 to 11.50
Wrought turnings	12.50 to 13.75
Heavy Cast Scrap	17.50 to 18.50

PHILADELPHIA.

Considerable Importations of Middlesboro Iron Begun.—Some Plants Close.

October 30.

Pig Iron.—Prices continue to rise under the extraordinary demand for iron both for 1906 and 1907, and nobody has the hardihood to predict when the top notch will be reached. Two interesting features of the prevailing scarcity of pig are the closing down of several small establishments unable to get the car or two of supplies necessary to keep them going and the expected arrival here this week of the first of the cargoes of Middlesboro iron to which previous reference has been made. This cargo, some 6,000 tons, will be followed by four others of similar size, making 30,000 tons in all, bought by one large firm. Practically all of the first two cargoes has been sold for about $21.50 at dock, and no difficulty is anticipated in disposing of the remaining 18,000 tons. Some of the iron is to go as far west as Pittsburg, though most of it will be consumed in nearby territory. Some small quantities of Scotch iron have also been brought in, and there are rumors of further heavy importations of English iron. It is hoped that these imports will be useful in preventing a runaway market. The amount is not sufficient to cause a reaction, but is still large enough to show consumers that there is another source of supply for them in addition to the American furnaces. Prices are hard to quote with absolute accuracy, as consumers threatened with a shut-down of their plants are willing to pay extraordinary sums for spot shipments of iron. Instances have been known where $26 and $27 has been paid for small shipments of No. 2X foundry. Disconcerting features which promise to keep prices up for six months at least are the threatened scarcity of ore, many furnace men having been notified that they must be content with a reduction of from 10 to 20 per cent in their orders; the advances in the prices of ore, coke and labor, and the prospects of a serious car famine, which is already beginning to pinch. Prices for 1907 shipments, mostly second quarter, may be quoted as follows:

No. 1X Foundry	$23.50 to 24.25
No. 2X Foundry	22.75 to 23.25
No. 2 Plain	22.25 to 22.75
Standard Gray Forge	19.25 to 19.75
Basic	20.50 to 21.25
Low Phosphorus	26.00 to 26.50

New Material.—The market continues to absorb a vast amount of new business without any of that excitement which attends the leaps in pig iron. Thanks to the increased productive capacity deliveries are reasonably prompt, and prices show no change from the figures already quoted:

Beams, channels and angles according to specifications, 1.83½c to 2c; refined iron bars, 1.83½c to 1.88½c; steel bars, 1.78½c to 1.83½c; plates, 1.73½c to 1.83½c.

Old Material.—The mills are buying well, and the market may be described as fairly active, without any very marked changes in prices. Dealers are confident, however, that with the advent of winter and the usual decrease in supplies customary at that season of the year, prices are bound to go higher and be more in keeping with higher quotations for pig iron. In the meantime they may be quoted as follows.

Old steel rails	$18.50 to 19.00
No. 1 steel scrap	18.25 to 18.75
Old steel axles	22.50 to 23.00
Old iron axles	31.00 to 32.00
Old iron rails	26.00 to 26.50
Old car wheels	21.00 to 21.50
Choice scrap, R. R. No. 1 wrought	22.00 to 22.50
No. 1 yard scrap	20.00 to 20.50
Machinery scrap	19.00 to 19.50
Low phosphorus scrap	22.50 to 23.00
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	15.50 to 16.00
No 2 forge fire scrap, ordinary	12.00 to 12.50
Wrought turnings	14.25 to 14.75
Axle turnings, heavy	15.00 to 15.50
Cast borings	11.00 to 11.50
Stove plates	14.00 to 14.50

BIRMINGHAM.

Occasional Sales of Spot Iron at High Prices Noted.

October 29.

Some small lots of spot iron were sold in the Birmingham district during the past week at $20 per ton, No. 2 soft. A number of orders were booked for iron to be delivered during the second quarter of the coming year with a few for delivery between January and April. The second quarter iron is bringing $17 per ton, No. 2 foundry, while that for the first quarter has a better price by from fifty cents to even one dollar. There is no indication that the demand is going to ease up, which means that for the first half of the year at least there will be no reduction in price and that furnaces will be required to produce their limit. There is a belief expressed here that during the last months of this year the probable make of the first six months of the coming year will be fairly well placed and that before the end of the first quarter of 1907, sales will have been made for iron to be delivered during the last half of the year. In other words, it is believed that there will be a strong demand for iron all through the coming year. Inquiry at some of the furnace company's offices elicits the information that all efforts are now being made to ship out the product instead of getting new business. There is still some complaint as to the railroad car shortage and to this is charged the delaying of deliveries of iron. There is a little iron on the furnace yards, but it belongs to other interests than the furnace company protecting it and therefore cannot be used for immediate business. Many requests are being received for immediate delivery, and one instance is noted where a lot of 150 tons of No. 2 soft was offered at $20. Before five hours had elapsed instructions had been received to ship the product.

The steel situation is still active with the probable output for several months in all departments well sold up. More business is being offered for all steel articles and with proper time for delivery being allowed the orders are being booked.

ST. LOUIS.

Car Shortage and Decreased Output Delay Deliveries.

October 29.

Pig Iron. — Twenty-one dollars Birmingham was paid for one lot of No. 2 spot this week and nothing can be picked up under $20, with offerings scarce. Deliveries are running behind on account of the car shortage and the decrease in production, so that some melters in this district are threatened with suspension for a time. Off grades of pig are being accepted on contracts calling for straight No. 2. This has created a greater demand for high silicon iron to be used in the mixtures, with the price, of course, showing an advance.

Practically no first quarter iron is being offered, but the quotation is $18.00 to $18.50. There is still some second quarter to be had at 50 cents under these figures. For the first half $18 is the common figure.

Inquiries are in moderate volume.

There is hardly that interest in the market there was a week ago, but still prices continue to advance with the usual regularity which has characterized the market for the last month and a half.

Quotations for the first quarter, including the freight rate of $3.50 from Birmingham to East St. Louis, range as follows:

Southern No. 1	$22.00 to 22 50
Southern No. 2	21.50 to 22.00
Southern No. 3	21.00 to 21.50
Southern No. 4	20 50 to 21 00
Gray Forge	20.00 to 20.50

Coke.—Coke has advanced to $7.05 to $7.30 delivered in St. Louis. A slight premium is frequently paid for prompt shipment. The activity of the Steel Corporation in buying up large tonnages is given as the cause of the advance.

Metal Market

NEW YORK.

October 29.

Pig Tin.—The market is quiet and lower. Trading abroad was marked by considerable fluctuation ascribed to difficulties of the money situation. Domestic consumers bought at lower prices freely.

The following are today's quotations. Spot and October, 42.00 to 42.05; November, 41.90 to 42.00; December. 41.82½ to 41.87½; January, 41.80 to 41.85; London, £191 10s and £192 10s. Arrivals for the month to date, 3,245 tons. Afloat, 2,070 tons.

Copper.—A tight money market has interfered with speculative operation and prices show a decline. Today's close was dull. Today's quotations: Lake, 21¾ to 22½; electrolytic, 21½ to 22; casting, 21¼ to 21¾; London, £97 12s 6d and £98 7s 6d. Exports for the month to date, 14,667.

Lead.—London reported a decline which produced an easier feeling here. Today's quotations: 5.85 to 5.95; St. Louis, 5.85. London, £19 5s.

Spelter.—The market is quiet with the demand only moderate. Today's quotations: 6.20 to 6.30; St. Louis, 6.20; London, £27 15s.

CHICAGO.

October 30.

The most conspicuous change in the metal market is the $3 advance in sheet zinc, putting that product on the basis of 7.90c list f. o. b. LaSalle in car lots of 60-lb. casks. Copper is fractionally higher, lake and casting being quoted 25c Chicago. This material is very scarce and early shipments are hard to obtain. Pig tin is quoted 46c; spelter 6.50c to 6.60c; lead desilverized 6.10c to 6.15c, all for carload lots, Chicago delivery. Cookson's antimony is unchanged at 28½c; and other grades from 26½c to 27½c. Demand for old metals is brisk and prices are slightly higher. We quote dealers' selling prices, as follows:

Copper wire, 18½c; heavy copper, 18¼c; copper bottoms, 17¾c; copper clips, 18c; red brass, 17¾c; red brass borings, 14¾c; yellow brass, 13¼c; yellow brass borings, 11¾c; light brass, 9¾c; lead pipe, 5.40c; tea lead, 5c; zinc, 5c; pewter, No. 1, 26c; tin foil, 32c.

ST. LOUIS.

October 29.

Lead was strong today at $5.90. Special soft brands are held higher. Spelter was quoted at $6.20. It is scarce and wanted at that figure, but no sales are reported.

Since the rule has been established by the smelters to buy all ore on dry weight basis prices of zinc ore have advanced $2 a ton. The highest price paid for lead ore last week was $83.50 a ton.

LATE RAIL SALES.

(Special Telegram.)

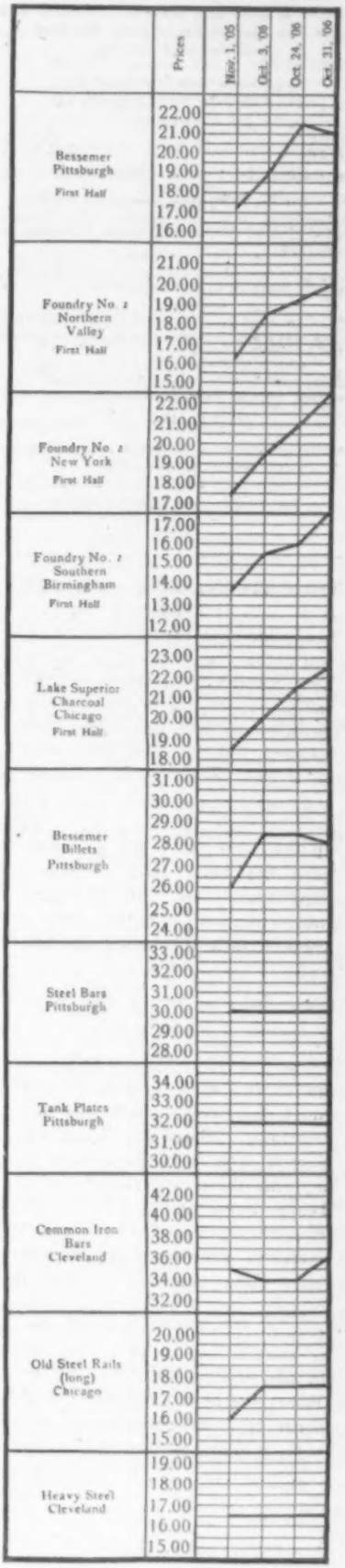
New York, Oct. 31.—Late rail sales include about 50,000 tons to trolley roads and frog and switch companies. A large tonnage is pending, trolley lines alone asking for some 30,000 tons, while trunk lines are also in the market. The contract for 500 tons of steel for a sugar house in Hawaii has been awarded to Milliken Bros.

Tech. School For Buffalo.—The Buffalo Foundrymen's Association is the latest local organization to come out with a public announcement in favor of the proposed new technical institute for this city. A municipal institute of such a character has been proposed and many business and industrial organizations are coming out in favor of the installation of this institution. At the last meeting of the Buffalo Foundrymen's Association, Secretary John Gorss was instructed to send out a letter to every member of the association asking him to assist the project along.

Foundries Are Fewer.—In the ten leading states, at the time of the 1905 census, there were 8,993 foundry and machine shop establishments with a capital of $845,024,825, as compared with 9,324 establishments having a capital of $665,058,205 in 1900. The value of products increased from $644,990,999 in 1900 to $685,901,388 in 1905. In the latter year Pennsylvania was first in the number of establishments with 1,182, New York second with 1,243 and Ohio third with 866.

PRICE CHART.

(Pig Iron Quotations are For Delivery During First Half of 1907).


Prices
Nov. 1, '05
Oct. 3, '06
Oct. 24, '06
Oct. 31, '06
Bessemer Pittsburgh First Half
22.00 21.00 20.00 19.00 18.00 17.00 16.00
Foundry No. 2 Northern Valley First Half
21.00 20.00 19.00 18.00 17.00 16.00 15.00
Foundry No. 2 New York First Half
22.00 21.00 20.00 19.00 18.00 17.00
Foundry No. 2 Southern Birmingham First Half
17.00 16.00 15.00 14.00 13.00 12.00
Lake Superior Charcoal Chicago First Half
23.00 22.00 21.00 20.00 19.00 18.00
Bessemer Billets Pittsburgh
31.00 30.00 29.00 28.00 27.00 26.00 25.00 24.00
Steel Bars Pittsburgh
33.00 32.00 31.00 30.00 29.00 28.00
Tank Plates Pittsburgh
34.00 33.00 32.00 31.00 30.00
Common Iron Bars Cleveland
42.00 40.00 38.00 36.00 34.00 32.00
Old Steel Rails (long) Chicago
20.00 19.00 18.00 17.00 16.00 15.00
Heavy Steel Cleveland
19.00 18.00 17.00 16.00 15.00

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND

BOSTON DULUTH
CHICAGO NEW YORK
CINCINNATI PHILADELPHIA
PITTSBURGH

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND, AS SECOND CLASS MATTER

PRINTED IN AN OPEN SHOP

November 1, 1906.

UTILIZATION NOT CONSUMPTION.

The subject of the probable duration of the world's iron ore supply has been made tiresome by those who seek to show that a famine is almost imminent. No sooner has the excitement quieted down in one place than it is stirred up in another. Just now it appears that England is suffering from the agitation of alarmists in this direction.

The natural and sufficient answer usually given to those who raise these bogies is that only a small proportion of the earth's surface has been sufficiently explored for iron ore, so that it would be a miracle if all, or nearly all, of the world's resources were known, and, furthermore, that as long as the visible supply is increasing, it is hardly time to talk of exhaustion. Not much more than a hundred million tons of ore is being mined per year over the whole world, and discoveries of new deposits or increased knowledge of old deposits certainly cover a greater tonnage than this every year. These features have been thoroughly threshed out.

Another point, however, although it has often been mentioned, deserves more emphasis than has been given it, and this is that, generally speaking, the products of iron ore are not consumed, but are merely utilized, the idea then being that they will come back again, in their own due time, as scrap, which in future will more largely supplement the supply of iron ore than it does at the present time. The reasoning is very good, but one can go a step farther and point out that the material does not necessarily need to be scrapped in order eventually to decrease the demand for iron ore. It can perform the function still more perfectly by merely remaining in use.

Surely it must be admitted that there is some quantity of iron, however large, which will be found to be sufficient to the needs of a single human being and when enough iron has been put into use to supply the needs of each human being, the further demand will be only for the purpose of replenishment against what is lost by oxidation and otherwise, and to provide for the increase in population. Civilization on this earth is thousands of years old; within much less than a century the human race has discovered that iron is extremely useful and that in the earth's crust there are enormous deposits of its ore. What more natural than that man should promptly proceed to convert that ore into iron as rapidly as possible? When the ore has been largely consumed, man will have been supplied with the iron, and will have the great bulk of it in use. The period we are in now should be considered one of putting into use, rather than one of consumption.

The United States has imported iron and steel products representing roughly in the neighborhood of 30,000,000 tons of pig iron, and has exported something like half that quantity. The country has ceased importing any large tonnage, but has not become, relatively speaking, a large exporter. The domestic production to the end of the current year amounts to about 320,000,000 tons, so that the total supply has been about 335,000,000 tons, or say 340,000,000 tons to give four tons per capita to our population of 85,000,000. The bulk of the products made from this pig iron is in actual use today.

Now, it is not unreasonable to suppose that the limit of one man's requirements in iron will be reached at some small multiple of four tons. Of iron ores now successfully worked we already have a visible supply of three billion tons or more, enough to quintuple each individual's supply. It would take a very long time to quintuple our population, since it is at present increasing by only 1.6 per cent a year, although this is undoubtedly a period of more rapid increase than can be expected indefinitely.

It might be urged that the case of the world at large is different from that of the United States, that while the United States may have in actual use its three or four tons per capita, the billion and a half people in the rest of the world must be given its iron. The recent estimate of Professor Tornebohm put the world's visible supply of iron ore at 10,000,000,000 tons, a quantity utterly below the probabilities, yet enough to give to every man, woman and child in the world three tons or more of pig iron or its equivalent. Now the world at large is not adopting iron rapidly; the exports of the great iron-making countries are not increasing at as great a rate as their production; with all the iron they already have in use they are increasing the use more rapidly than the rest of the world. If, or when, the rest of the world comes to use iron freely, it will be a miracle if it does not find some supplies of its own.

There are various currents at present which show that the putting of iron into use constitutes merely a period, with limits. There was such a period in the consumption of steel rails for new railroads, and when the crest of the railroad building wave passed, as it did, rail production declined. At its height there was record rail production and not for twelve years was that record again attained; then came the present period of heavy renewal, the long western roads replacing their light sections with heavy sections. When that work has been done rail production will have passed another high point, probably for many years. We have only lately entered a period of steel car building. A few years ago the total number of cars was increasing rapidly; steel cars are replacing wooden ones, while the total number of cars is increasing but slowly, if at all. When the replacement is completed, most of the work will have been done. The total tonnage of freight moved has increased less rapidly than the production of pig

iron; the total number of cars has increased less rapidly than the tons of freight moved. Certainly there is some kind of a limit to the number of ton-miles of freight per year required to maintain the comfort and happiness of an individual. Again, we are building steel factory buildings, office buildings and hotels at a much more rapid rate than our population is increasing, but the time must come when each head of population will have been supplied. One individual cannot work in two factories, transact business in two offices, or live in two hotels at one and the same time.

All these observations point to the same conclusion, that we are in a period of converting iron ores into iron and steel products and putting the products into use, and that the present rate of activity is no guide to the indefinite future. Dissertations on the probable supply or demand a century hence have as little bearing on the subject as the interesting but wholly unrelated ethnological facts that the underlying pigment of the aboriginal American is ferruginous while that of the aboriginal African is carbonaceous.

IS IT REALLY THE NATION'S SHAME?

We are in receipt of the following letter from Mr. C. M. Kimbrough, president of the Indiana Bridge Co.:

Editor THE IRON TRADE REVIEW,
Cleveland, Ohio

Dear Sir:

I have read with care and interest your article in THE IRON TRADE REVIEW of Oct. 4 under the heading "The Cuban Expedition—A Nation's Shame."

If I understand your article, it is a plea for the ship subsidy bill now before the lower house of congress—having passed the senate at the last session. I am not in favor of ship subsidies nor any other kind of subsidies from the government. The government should not collect money from the people except for the needs of government. If the government needs war vessels or transportation vessels, it should build and own them, and operate them.

The government was not formed, and is not supposed to be administered to be a competitor of, nor a partner with its citizens as individuals or companies. If Germany, England and France have more commercial water craft than the United States, may it not be because these countries have a larger population to area than we have; and therefore have to take to the water as their only resource for livelihood?

And is it not far better that our government should hire these foreign vessels when it needs them, than to have millions of money tied up in such investments, available for profit only on rare occasions, such as the Cuban expedition? Because of the vast resources of the territory of the United States, our capitalists find abundant and profitable use for their money in investments on land; and therefore, they ask the government to furnish a part of the money—give it, not loan it—if the government wants more vessels, on the rare occasions when it shall have reason to move an army and its supplies, or perchance clear decks for a sea fight.

While it is entirely proper that the government should build a good navy, a good ship canal, lighthouses, irrigating dams, and do such other things as directly and indirectly benefit all the people, it certainly has no moral right to take the people's money and invest it in a business that is purely commercial, and lose the investment eventually to the partner, who is simply a merchant, for personal gain.

Your point is not well taken with respect to the new business the ship subsidy bill would create, for there is now at all points in the United States more business than can be cared for. You current issue of THE IRON TRADE REVIEW proclaims this. Moreover, there are not laborers enough for what business we now have.

To tax the people to build ships in such prosperous times as these, when everybody is employed and capital well invested, is only to invite immigration of a class of people of whom we have too many already, and start anew a lot of speculators at wild cat schemes, which we have been ridding ourselves of during the last two or three years, for the common good.

If the merchant marine is a profitable field for investment, it is passing strange our shrewd Yankee investor has not found it out. Millions are invested every year by our citizens in commercial pursuits—many of them new and untried; and yet a few people and some politicians continue to proclaim the great advantages of a merchant marine, and to urge the government to do that which morally it has no right to do, viz. pay subsidies to ship builders.

Respectfully,
C. W. KIMBROUGH.

Muncie, Ind., Oct. 11, 1906.

Our esteemed correspondent is right in interpreting our article as in favor of the ship subsidy bill now pending before the lower house of congress, under the provisions of which our government would be freed from the disgrace of being compelled to call upon other nations to lend us their ships to convey our troops. Whether the occasions when they are needed are few or many, we must have American ships, as all other nations who have any claim to actual independence have ships of their own. Our correspondent states he is not in favor of any kind of subsidies from the government. We infer from this statemen that he is a free trader, although he is engaged in a business which owes its prosperity to a protective tariff. In its essence there is no difference between a protective tariff and a subsidy, for in both cases home industries are nourished, protected and built up through government assistance. Mr. Kimbrough is willing to grant that the government should build war vessels and even transportation vessels, and he does not object to the building of a ship canal, but he does object to the encouragement of ship building. Even if he is a free trader and does not believe in tariffs, there is still abundant reason why he should be willing to support the pending bill. He is perfectly willing to grant that one of the fundamental needs of the government is to fortify itself to meet attack and to defend its honor. Our chief army and navy officers—Dewey and Chaffee—last year pointed out that we needed a merchant marine upon which the government might call in time of need, approximately three or four times larger than that we at present possess. For the needs of the army alone, Gen. Chaffee pointed out, we needed two and one half times as many merchant ships of ocean-going size as we then had—as we now have. These are needed for auxiliary war and navy needs, for the conveyance of soldiers, horses, mules, fodder, munitions of war for the army, for the navy for scouts, for auxiliary cruisers, squadron colliers, distilling boats, dispatch boats, and a myriad of purposes. So, we have the most experienced and highly informed of our army and navy officers, urging upon congress, in official reports, legislation that will cause the building up of an American merchant marine three or four times its present size.

If we review the history of the country, we find that in the first act of the first congress, introduced the second day of the session in 1789, a bill was presented containing the following preamble: "Whereas, it is necessary for the support of the government, for the discharge of the debts of the United States, and *for the encouragement and protection of manufactures*, that duties be laid

on goods, wares and merchandise imported." In that tariff bill provision was made for a ten per cent reduction in duty on all imports in American vessels; besides, the duties on teas were double, and in some cases treble, those laid on such imports in foreign vessels. This was a bill drawn by James Madison, heartily approved by Thomas Jefferson, then secretary of state, and signed by George Washington, president, on July 4, 1789. It passed congress practically unanimously, and a vast number of those who had participated in the revolution, and in the establishment of our constitution and our form of government, were members of that congress and voted for that bill. The trouble has been that, although even the founder of the party which has been identified with all of the free trade movements in this country was in favor of encouraging the merchant marine, the policy of Jefferson was not continued, nor was any other policy which aimed to upbuild the merchant marine adopted, and the result is that our shipping is today but one-third of what it was in 1861 and even less than it was in 1810.

In support of our statement that many men are idle on account of ship building on the seaboard not being encouraged, we call attention to the fact that the Brotherhood of Boilermakers and Iron Shipbuilders, carrying a membership of nearly 50,000, states that 20,000 of its men are walking the streets looking for work at their trade,—building of ships.

So much for the general subject of building the merchant marine. As to what would be accomplished by the pending measure, *The Marine Review* in a recent open letter to Secretary of State Root clearly established the following points:

1. That the republics of this hemisphere are a unit in desiring the establishment of lines of American steamships, giving each with the other regular, frequent, direct and rapid communication.

2. That they realize that government aid, or subsidy, is necessary to secure the establishment of such lines, because they severally and unitedly say so.

3. That the results would be permanently beneficial to all of the republics of this hemisphere, promotive of better and more intimate social relations, better trade relations, and that degree of confidence and interdependence so much desired by us all.

If all of these beneficial results will result from the passage of the ship subsidy, can even a free trader give reasons for failing to enact it?

CONNEAUT HARBOR VISITED BY PITTBURG ENGINEERS.

The wonders of Conneaut Harbor, O., the lake terminal of the United States Steel Corporation for the receipt of its ore supply and the northerly terminal of the Bessemer & Lake Erie railroad, one of the constituent companies of the corporation and over which its iron ore is shipped to the furnaces in the Pittsburg district, were looked into by the members of the Engineers' Society of Western Pennsylvania on Saturday of last week.

A special train took the party, nearly 300 strong, from Pittsburg to Conneaut Harbor and brought them back again, tired with the exertions of the day, but satisfied with the feeling that they had seen things handled in a big way, in that 10,000 tons of iron ore were unloaded from a coarse freight-carrying lake steamer to the docks and railroad cars in less than four and one-half hours, by means of the most modern unloading facilities and at a minimum cost.

The day was cold and blustery with rain and the first of the recent lake storms was blowing in from the wide expanse of Lake Erie, but the engineers boarded tugs and were given a short lake ride, enough to toss them about a bit while they viewed the harbor from its entrance and enabling them to see the concrete breakwater and piers, just within which are located the unloading docks, backed by immense piles of ore held in storage until required by the furnaces between the closing of the present season of navigation and the resumption of lake season next March or April.

The Pittsburg party, in personal charge of General Manager Utley and chief engineer H. T. Porter, of the Bessemer & Lake Erie railroad, and a committee composed of Morris Knowles, F. R. Dravo, John Camp, Ralph Crooker Jr., Emil Gerber, E. P. Taylor, and Sec. F. V. McMullin, of the society, was met at Conneaut Harbor by Superintendent R. R. Richardson, of the Pittsburg & Conneaut Dock Co., P. J. Flickinger, C. Walker, G. S. Meek, S. J. Blake, Harry Buss, James Tobin, Edward Culbertson, M. E. Curtis and H. D. Prosser, who conducted them to the points of interest.

Conneaut did not become an ore-receiving port until 1893, though a small shipment was received in 1892. Since that time it has steadily advanced, receiving a great impetus in 1896 when the Carnegie Steel Co. leased extensive ore properties on the Mesabi range and projected the Bessemer & Lake Erie railway to Pittsburg. Since that time Conneaut has grown steadily and must in the nature of things continue to grow. Following are its ore receipts since it became an ore-receiving port:

Year.	Gross Tons.
1892	1,130
1893	203,207
1894	237,905
1895	244,967
1896	327,623
1897	495,327
1898	1,404,169
1899	2,320,696
1900	2,556,631
1901	3,181,019
1902	4,300,301
1903	3,903,937
1904	4,083,655
1905	5,327,552
Total	28,588,119

NATIONAL TUBE PLANT INSPECTED.

A party of about one hundred, gathered from the ranks of the Central Supply Association and the jobbing field of the central states, visited Lorain, O., Thursday of last week as guests of the National Tube Co. and spent the entire day inspecting the extensive works of that concern. Three special interurban cars conveyed the party from Cleveland to Lorain and the morning was devoted to a visit to the ore-handling machinery and the ore bins, the blast furnaces and the steel plant. Luncheon was served in the commodious offices of the company on the grounds, after which a vote of thanks to the National Tube Co. for the hospitality of the occasion was proposed and was given with three rousing cheers. Response was made by J. W. Downer on behalf of the company. A telegram from Vice President Edward Worcester, regretting his inability to be present, was read and he was sent a message of greeting. The entire afternoon was then given over to a tour of the tube mills, which proved vastly interesting to the members of the party whose experience had been largely concerned with the selling of the product which they here saw manufacturd for the first time. The party returned to Cleveland in the late afternoon.

Furnace No. 4 at the Bethlehem Steel Works has been blown in after a considerable idleness for remodeling and repairing.

SWANZEY DISTRICT

PROMISES TO BECOME IMPORTANT ORE PRODUCER.

Exploratory Work in Vicinity of Negaunee.—Old Mines to Resume.

(Special Correspondence.)

Norway, Mich., Oct. 30.—It has been only of late years that the region to the south of Negaunee has been given systematic attention on the part of mining companies and the operations in those fields are steadily expanding; in fact, there is now every reason to believe that the mines of the so-called Swanzey "range" an outlying spur of the Marquette iron formation, twenty miles distant from Negaunee, will some day rival those of the Ishpeming and Negaunee basins, while the Cascade district, five miles south of Negaunee, is destined to grow in importance and size. It is here that the Volunteer, Richmond, Moore and other mines have been opened.

In the Swanzey district it will not be long before there will be a town platted at one of the mines being operated by the Cleveland-Cliffs company. The population has more than doubled the past year, with indications that within a very few years it will be many times as large. The corporations operating properties there are preparing for big work. Five mines are now working, and two of these are of good size. The country is being explored for some miles around the locations, and while results have not been made public the impression prevails that immense bodies of ore have been located in the region.

The Green Creek District.

Closer to Negaunee, between the Swanzey and Cascade groups, the Green Creek district is being explored, presumably with important results, while even in the country to the south of the Swanzey range a mining corporation that has been exploring at points in the Swanzey and Little Lake districts has a diamond drill in commission as far distant as McFarland's hill, which is only about thirty-five miles north of Escanaba. What results have been met with here is something that is not known publicly, but there is reason to believe the ore formations will be found extending into that field.

In the Negaunee basin, itself, the mines are growing rapidly. The Maas property of the Cleveland-Cliffs company has only been started; the Steel Corporation's Queen group is expanding; the Mary Charlotte of the Kaufman-Breitung interests is just opening up and in time will be one of the biggest mines on the range; the same can be said of the Rolling Mill, now being developed by the Jones & Laughlin Co., and the Cleveland-Cliffs company's Negaunee will hold its own for some years to come. There is talk now of the construction of an electric line extending south from Negaunee to Little Lake, a distance of about twenty miles, and utilizing for its operation power generated at the falls of the Escanaba river. In view of the great mining development now only fairly starting in the territory concerned, taken in connection with the woods operations and the agricultural possibilities, a project of the kind undoubtedly ultimately will be carried out.

Imperial to Resume.

In the western portion of the Marquette range, as soon as the machinery can be put in good condition the Cleveland-Cliffs company will resume operations at its Imperial mine, located in Section 35, Town 48-31. This work will require several weeks' time. The hoisting plant and air compressor will be overhauled, and two new boilers will be installed. The restoration of this mine to the active list is a striking commentary illustrating the healthy state of the iron trade. While the ore bodies are extensive, the product is of comparatively low grade, like that of the other Baraga county properties, and it has been some years since there has been a demand for it. The mine consequently has been idle, as have the others opened on the same formation; now not only is the Imperial to be restored to the shipping list, but, as announced recently, Rogers, Brown & Co. are to reopen the Ohio and develop the Portland as well. The working force at the Imperial will be as large as can be employed to advantage, the start being made with at least sixty or seventy-five men, while more will be taken on if they can be secured. It will require only a few days to unwater the workings, as these are not extensive, there being but two shafts, each down about 200 feet, and not much lateral development. The Imperial was opened originally, in 1882, as two mines, the Webster, an open-pit proposition, and the Wetmore. The Imperial has shipped, all told, 152,000 tons of ore, of which nearly one-half was mined in 1900. The Webster portion of the property has produced 35,000 tons. For its Cliffs Shafts mine, the Cleveland-Cliffs company has received at Ishpeming a new air compressor from the Nordberg works at Milwaukee. The machine is similar to that in commission at the Cleveland Lake mine, and will generate power for fifty drills. About thirty drills are at present in operation at the property.

Although the season is well advanced, a substantial tonnage of ore still remains in stock at the Steel Corporation's Queen mine, at Negaunee. However, shipments are being made from it steadily and it will be pretty well cleaned out by the close of navigation. There is also considerable ore piled up at some of the other Negaunee mines, including the Steel Corporation's Hartford and the Republic Iron & Steel Co.'s Cambria. Even if all the ore is not shipped from the two latter properties this fall there need be no curtailment in the output, as there is ample stocking ground.

The Republic company's Lillie mine, which has not been very active of late, also has ore in stock. Shipments are being made from the Lillie to the furnace at Manistique, and the Cambria is shipping to the furnace at Newberry, as well as to lake ports. That there will be an increased output from the Queen the coming winter is evident from the preparations being made on the surface to take care of a larger tonnage. The stocking ground, which was pretty well taxed when navigation opened last spring, is being enlarged, as is the stocking space for the winter's supply of coal.

It is announced that the Midvale Steel Co., Philadelphia, has obtained an order from the Italian government for 2,100 tons of armor plate for an Italian man-of-war. The order was secured in competition with a number of European firms, including the Krupp interests.

The labor scarcity in the Colorado iron and steel district has been largely overcome by the fact that men who have been employed on ranches and in some of the mines are now seeking winter employment.

The Middletown Car Works has begun an order for 500 coal hoppers for the Norfolk & Western Railroad Co., under a new set of specifications. The works has finished an order for 300 box cars for the Pennsylvania railroad.

The Philadelphia & Reading Railway Co. is now occupying the whole of its new shops at Reading, Pa.

IN THE FIELD OF LABOR.

The Cincinnati Foundrymen's Association, Cincinnati, has been organized by 28 of the largest foundries in Cincinnati and vicinity. The objects of the association are social and protective. The officers are: George McG. Morris, president; Herman Ukotter, Covington, vice president; Henry Webber, secretary, and A. G. Wilson, treasurer.

The strike of blast furnace workers of the Carnegie Steel Co., at Newcastle, Pa., necessitated the closing early last week of the Rosena and Red Jacket furnaces, and the curtailment of operations of the Raney and McKinley furnaces. A sufficient number of workmen have been brought in to operate the plants.

Hearing on an order requiring striking molders at Milwaukee to show cause why they should not be punished for alleged violation of the injunction recently issued on the appeal of the Allis-Chalmers Co., has been continued until Nov 1.

A strike has been declared at the plant of the American Steel Package Co., Defiance, O., for a nine-hour day with minimum pay of $1.50, and time and a half for over-time. About 50 men are out. Officers of the company have declared that if an agreement cannot be reached shortly the plant will be removed to Pittsburg. The gun works, in the same building, are not affected.

A number of workmen at the plant of the Marion Iron & Brass Bed Co., Marion, Ind., are out on strike for a reduction in working hours from ten to nine without a reduction in rates.

Superintendents and foremen of the various plants connected with the Toledo branch of the National Metal Trades Association were recently banqueted at the Toledo club. A. A. Schaff, manager of the Pope Motor Car Co., presided, and addresses were delivered by Acting Commissioner Robert Wuest and others.

Final action on the redistricting of the territory of the National Metal Trades Association has been deferred until the annual convention.

Julian V. Wright has been formally appointed commissioner of the National Metal Trades Association.

William Kroeschel, John D. Hibbard and F. K. Copeland have been appointed a committee to represent the National Metal Trades Association at the Chicago meeting of the Citizens Industrial Association, Dec. 4.

The Iron Molders' Union of North America has issued a strong appeal for all dues in arrears, stating that over 50 local unions are now engaged in strikes. The last assessment by the executive board was $1 per head a month for August, September, October, November and December, making a total of $5 from each man.

FRENCH IRON AND STEEL PRODUCTION.

The statistics for the production of iron and steel in France for the first six months of 1906, with comparative figures with the corresponding period of the preceding year, are published in the French *Journal Officiel*.

The total pig iron production in the first six months of 1905 was 1,499,802 metric tons; for the corresponding period of 1906, it was 1,573,504 tons. This was divided as follows: Forged pig, 344,291 tons, an increase of 26,431 tons; foundry pig, 282,625 tons, a decrease of 72,963 tons; Bessemer pig, 80,354 tons, an increase of 354 tons; basic pig, 841,398 tons, an increase of 110,355 tons; special pig, 24,836 tons, an increase of 9,525 tons. Of wrought iron, there was produced 384,800 tons, compared with 366,682 tons in the corresponding period of 1905.

The total production of worked steel was 711,658 tons, compared with 634,896 tons for the corresponding period of 1905; this was divided as follows: rails, 167,950 tons, an increase of 12,260 tons; merchant steel, 364,777 tons, an increase of 67,435 tons; sheets, 146,632 tons, an increase of 2,972 tons; forgings, 17,590 tons, a decrease of 7,563 tons; steel castings, 14,709 tons, an increase of 1,658 tons. The production of steel ingots amounted to 1,159,546 tons, compared with 1,073,155 tons in the first six months of 1905; blooms and billets for the first six months of 1905 and 1906 were 514,339 and 457,863 tons, respectively.

The Waterman Motor Works, Detroit, manufacturing marine motors, is about to begin the construction of a new plant 75 x 200 feet. It will be of brick and will be equipped throughout with electrically driven machinery which has not yet been contracted for. Address all inquiries to George W. Graves, engineering architect, Cleveland Building, Detroit.

Among the furnaces which may be blown in before the end of the year will be No. 2 Paxton at Harrisburg; Tidewater at Chester, and one Saxton at Saxton, Pa. They are now being prepared. Punxy furnace at Punxsutawney, Pa. has just been relined and repaired.

STEEL FILTRATION PROCESS WILL BE TRIED.

(Special Correspondence.)

Birmingham, Ala., Oct. 30.—Announcement is made that a plant will be erected at Bessemer, twelve miles south of Birmingham, for the purpose of demonstrating the filtration process of steel manufacturing, using foundry iron instead of basic in the manufacture of steel. A corporation is about to be formed with capital stock of $150,000 and the plant will be put up at once. It is figured that within four months the works can be placed in operation and that a daily production of from 60 to 80 tons of steel can be secured, which will afford a strong demonstration of the patent, the right of which to manufacture steel has been secured from the Globe Steel Filtration Process Co. of Detroit. Citizens of Bessemer donate a site for the new factory. If the demonstration is successful, it is understood there will be other plants erected to use the patent on a royalty basis. The steel to be manufactured at the first plant will be used in manufacturing steel castings.

There is no change in the amount of iron being manufactured in this district. Despite all efforts in that direction, there appears to be but little improvement in the way of production. The car shortage is felt in the handling of raw material for the furnaces. While bins are being kept well filled, there is not as much ore and coal and coke or even limestone as some of the furnace companies would like to see. The weather has been favorable to a steady operation of mines where outside work is carried on. No apprehension is felt, according to expressions made in the offices of the various companies, as to the supply falling short at any time during the winter.

The foundry and machine shop trade is active as well as the cast iron pipe business. All industries in these lines are busy. The rolling mills in this district continue to work nicely. The finishing departments of the Birmingham mills (Republic Co.), are still under repairing.

Labor is very scarce still in the Birmingham district. In the iron and steel field as well as at the coal mines there is a constant complaint that enough labor cannot be secured. Several thousand men could find immediate employment in the coal, coke, iron and steel industries in Alabama, and if it were possible to get the labor the statement is made that a number of the industries would be put on double turn.

WESTERN CANADA

Plans to Make Use of Scrap Where It Accumulates.—Canadian Notes.

(Special Correspondence.)

Toronto, Can., Oct. 29.—A noticeable feature indicating the activity of the iron and steel trades and the favorable prospect of a continued heavy demand in the staple lines, is the number of new establishments being started throughout the province. Several American capitalists have recently been examining into conditions in Toronto with a view of establishing iron-working industries here, but matters are not sufficiently advanced to permit the publication of details. The growth of the industry in Winnipeg and the west, hitherto retarded by the heavy freights on raw material, is likely soon to receive an impetus from the utilization of scrap iron for rolling mill purposes in place of ore. As scrap accumulates in the west it will be found more profitable to work it up on the spot than to ship it east and bring back the product. Negotiations are understood to be on foot by which a large rolling mill industry will be established to work over the scrap, of which a plentiful supply is obtainable.

The Smiths Falls (Ont.) Malleable Castings Co. has purchased the Rideau Malleable & Foundry Co. of the same town, and the two concerns have been amalgamated.

A 20,000-ton contract for structural steel for bridges in Ontario, given by the Canadian Pacific Railway Co., has been divided between the Canada Foundry Co. of Toronto, and the Dominion Bridge Co. of Montreal.

The Canada Forge Co. has begun the erection of buildings at Welland, Ont., the contractor being the Welland Construction Co. Two buildings 50 by 100 feet each will be completed by Nov. 15, and others will afterwards be added. Electrical power to the extent of 75 horsepower will be installed and the company will begin manufacturing in January. The Welland Construction Co. also has in hand buildings in the same town for the Ontario Iron & Steel Co.

The village of Hespeler, Ont., has voted a loan of $15,000 to the Hespeler Machine & Tool Co. to establish a new industry.

The Polson Iron Works of Toronto, provided they can buy from the city a piece of land with 132 feet frontage on Esplanade street, to the west of their present works, will begin the manufacture of steel castings, for which they are now dependent on American manufacturers.

Einar Lindeman, who was commissioned by Dr. Eugene Haanel, Canadian superintendent of mines, to examine iron ore deposits near Bathurst, N. B., has discovered an iron ore bed of much larger extent than those he was detailed to examine. It is 75 feet high and from 80 to 100 feet in width and extends 1,800 feet down to the Nipissiquit river, which it apparently crosses. The discovery is due to the method originated by Dr. Haanel of examining magnetic iron ore deposits by magnetometric measurements.

As the result of investigations in Europe by G. R. Joughins, mechanical superintendent of the Intercolonial railway, it has been decided to place three large motor cars in operation on the road next spring, increasing the number as fast as they can be built. The service will be inaugurated at St. Johns, N. B., Moncton and Halifax to handle suburban passenger traffic. The motors and cars will be built in Canada.

ALLIS-CHALMERS VISITORS.

A party of distinguished visitors, including Judge E. H. Gary of the United States Steel Corporation, Cornelius Vanderbilt III, W. N. Read, a member of the board of directors of the Allis-Chalmers Co., and James H. Eckles, ex-controller of the currency under President Cleveland, visited the Allis-Chalmers works in Milwaukee Friday of last week. Charles Allis, ex-president of the company, denies a recent report that the Bullock Electrical Works would be removed to West Allis next January. It is known that arrangements are being made to turn out much of the electrical equipment from the new shops at West Allis, but Mr. Allis says the removals next spring will comprise only the engineering and office forces, so that these departments may be combined at West Allis. The office forces in Chicago were moved to Milwaukee over a year ago.

Additional Foundry.—The Chicago Malleable Castings Co., West Pullman, Chicago, has contracted for an additional foundry building, 75 x 265 feet, to be known as foundry No. 5. This building is one of the three additional units which are now under contemplation. The new foundry will be ready for occupancy Dec. 15. Provision has been made for the melting furnaces, annealing ovens and other necessary equipment.

James A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, O., states that five new cranes have just been ordered for the steel mill. When the equipment arrives and is set up, No. 4 cupola will be started. The cranes now in operation at the mill are working to their full capacity, and are holding down the tonnage of the mill.

STEEL CORPORATION ACQUIRES TIMBER LANDS.

Escanaba, Mich. Oct. 29.—The announcement was made in July last that the Steel Corporation had secured an option upon all the real and personal property of the Cedar River Land Co. in the counties of Dickinson, Menominee and Delta. This big deal has now been closed, and it involves a cash consideration materially in excess of $500,000. As a result of the transaction, 72,000 acres of land have changed ownership, of which nearly one-half, or 30,000 acres, are located in Menominee county. The deal also includes the large saw mill of the Cedar River company at Spalding, many dwelling houses and other buildings. The lands are thickly timbered with hemlock, cedar, basswood, pine, hardwoods and other woods, in the aggregate many millions of feet. It is the intention of the company to operate the saw mill steadily in cutting timber for the mines of the Menominee range exclusively, and it is estimated there is sufficient supply for this purpose for nearly thirty years. The transaction makes the Steel Corporation second only to the Cleveland-Cliffs company in the number of acres of land owned in the Upper Michigan, the concern having recently acquired large tracts in a number of other counties, among them Marquette and Gogebic, in both of which it is conducting logging operations. Notwithstanding this latest extensive purchase, the corporation will continue to buy as many logs and as much lagging from jobbers and homesteaders as possible. Huge inroads have been made in Lake Superior's forests during the many years lumbering has been an important industry of the region, and the mining companies, who annually use many millions of feet of timber, have for some time realized the necessity of husbanding available supplies and adding to them where possible. Timber that goes into the mines to support treacherous walls rarely ever sees the light of day again, and the great bulk of it is lost forever, much of it to be eventually ground up into splinters by the settling of the ground.

Incorporation papers of the Seneca Iron & Steel Co. have been filed at Buffalo. The company is capitalized at $300,000, and its directors are Louis E. R. French, Nelson S. Hallett and Arthur R. Jenkins, of Buffalo; Alexander Patterson, of Williamsburg, Pa., and James W. Persons, of East Aurora, N. Y.

PERSONALS.

Andrew Carnegie has returned from abroad, arriving Oct. 28 on the steamer Celtic.

Franz C. Reinhardt has been made president of the Passaic Steel Co. He succeeds the late A. H. Knapp.

Hugh M. Craig has been placed in charge of the Minneapolis office of the Janesville Machine Co.

Judge E. H. Gary and George W. Perkins were visitors at Chicago and the new town of Gary, Ind., last week.

Paul E. Noe has been appointed Chicago manager of the Braeburn Steel Co., to succeed J. W. Copeland, who resigned.

Edwin A. Potter Jr. has been appointed receiver for the Globe Iron Works, the principal plant of which is at Plano, Ill.

R. A. Laidlaw, of Detroit, has been placed in charge of an office just opened at Omaha, by the Trussed Concrete Steel Co., Detroit.

Charles Forrest and H. Otto Bart have been elected stockholders of the American Type Foundries Co., succeeding Rudolph Ellis and Monroe Smith.

George W. Graves, mechanical and structural engineer, has opened new offices in the Cleveland building, Detroit. All catalogs and samples will be placed on file.

T. W. Siemon, treasurer and director of the Westinghouse Electric Co., has been made assistant secretary as well, filling the vacancy caused by the recent death of P. F. Kobbe.

George H. Brusie, formerly with the Antrim Iron Co., but for the past seven years with the Manistique Iron Co., succeeds the late W. H. Nelson as manager of the latter company.

E. C. Berghoeffer, for a long time connected with the Chicago office of the Link-Belt Co., has been placed in charge of the St. Louis office recently opened at 913 Missouri Trust building.

C. G. Robinson, formerly superintendent of the Steel Foundry Co., Cincinnati, has returned to that city and is engaged in organizing a new company to manufacture small steel castings.

James A. Burden Jr. has been chosen president of the Burden Iron Co., Troy, N. Y., to succeed his father, the late James A. Burden. William P. Burden succeeds James A. Burden Jr. as vice president.

Francis E. Drake has been appointed general manager of the Societe Anonyme Westinghouse at Paris and Havre. He has had a wide experience in railroading and manufacturing, was director of machinery and electricity at the Paris Exposition and only recently organized the continental business of the Chicago Pneumatic Tool Co.

OBITUARY.

Bernard McGuckin, formerly superintendent of the Sharon furnaces of the Carnegie Steel Co., died recently at the age of 41.

Henry Minter, a founder of the firm of McCloud, Crane & Minter, died suddenly at Worcester, Mass., Oct. 15, at the age of 75.

John Monaghan Sr., until recently chief engineer for the Williams Cold Rolled Steel Co., died Oct. 24 at an advanced age. A son is connected with the Carnegie Steel Co.

Orlando L. Bicknell, manager of the Chicago Screw Co., died Oct. 22, at Oconomowoc, Wis. He had been ill for several years and had gone to a sanitarium in Wisconsin for relief. Death was due to spinal trouble.

Alfred Waites, sales manager of the wire rope department of the Wright Wire Co., Worcester and Palmer, Mass., died at the former place, Oct. 16, at the age of 63. He is survived by a widow and one daughter.

Lewis Henry Davies, secretary and treasurer of the Lewis Foundry & Machine Co., Pittsburg, died Oct. 21, a few hours after being caught by runaway street cars. Although but 30 years of age, he had been connected with this concern for 15 years, working up from the position of office boy until he came to occupy a prominent place in the foundry industry of that district.

David Smart, for more than 55 years a resident of Chillicothe, O., died in that city Oct. 28, at the age of 80, death being due to heart trouble. Mr. Smart was for several years mayor of Chillicothe. He was formerly connected with Richland furnace in Vinton county, for several years serving as its treasurer, and with the old Chillicothe foundry. His father was one of the early blast furnace superintendents of western Pennsylvania. He is survived by a widow, a daughter, Miss Mary, and a son, George, who is editor of THE IRON TRADE REVIEW.

The Virginia Bridge & Iron Co.'s plant, Burlington, N. C., was damaged to the extent of $90,000, Oct. 24, by fire.

NEW YOUNGSTOWN WORKS VISITED.

The Youngstown Sheet & Tube Co., Youngstown, O., entertained a party of about 140, principally jobbers and supply men, at its plant on Friday of last week. Many members of the Central Supply Association, which concluded its meeting at Cleveland on Wednesday, remained over and joined the number of iron and steel men from various sections of the country in the trip to Youngstown. A special train on the Erie carried the party to the works where they were joined by another carload of guests coming over the Pennsylvania from Pittsburg and the east, who had been entertained at the Youngstown club pending the arrival of their Cleveland friends. Luncheon was served on the special and to the Pittsburg party at the Youngstown Club, after which the train was moved to the plant and the entire afternoon was given over to an inspection of the new Bessemer steel works, plate, sheet, skelp, pipe mills, etc. The party was divided into small groups under the pilotage of President J. A. Campbell, Secretary George E. Day, Superintendent W. E. Riley, Assistant Sales Manager W. E. Manning, J. B. Jenks, F. A. Lathrop and others and a leisurely trip was made through the works, each process being carefully explained en route. The party then returned to the Youngstown Club where dinner was served and a rapid fire of speeches and stories was kept going with George E. Day as toastmaster. The Pittsburg party left shortly after dinner, the remainder gathering in the parlors of the club where more stories were told and more toasts were responded to. A pleasing feature was an interesting talk by James B. Wilkes, president of the Wilkes Rolling Mill, Sharon, who has seen the development of the steel industry from its infancy in the 65 years which he has spent in rolling mill work. The Cleveland special made a remarkably fast return trip, reaching Cleveland shortly after 10 o'clock.

The Chicago Pneumatic Tool Co. reports that business for the first nine months of the current year has shown an increase of 27 per cent over the corresponding period of 1905. Up to Oct. 25 orders booked during the month were 47 per cent heavier than in the same days of 1905, and 37 per cent heavier than during the same time in September. Over 1,500 new customers have been secured during the year.

A LIGHT GRAY IRON SPECIALTY FOUNDRY

THE PLANT OF THE FERRO MACHINE & FOUNDRY CO., CLEVELAND

Intricate Castings and Difficult Special Work for Automobiles the Principal Product

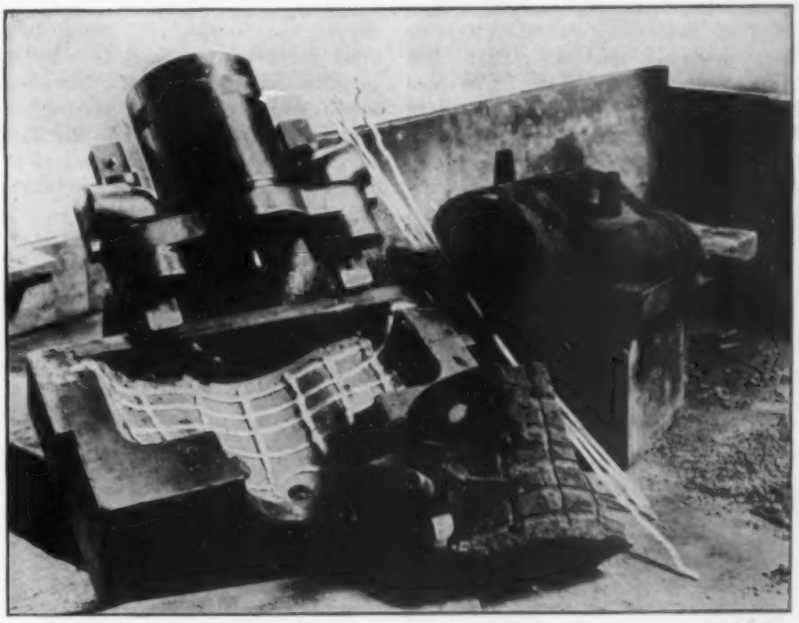
The plant of the Ferro Machine & Foundry Co., of Cleveland, O., is unique in a number of respects. In the first place it is an evolution of the foundry business, and in the second place it is the outgrowth of the demand for very high grade castings, which has been brought into existence by the modern design of automobiles, gas and gasoline engines.

A Line of Core Benches and Rack of Cores in the Core Department.

The most successful concerns in any line are usually those which make such a specialty of some particular line as to enable them to excel all others in that particular branch.

The original name of this firm was the Hoffman Hinge & Foundry Co. In the course of the evolution above referred to the hardware end was soon dropped and it became almost wholly a jobbing stove-plate foundry. When the automobile came into general use the automobile manufacturers, knowing that they required thin, sound castings, naturally turned to those concerns which had had most experience in these lines and this company took hold of a number of automobile cylinder jobs.

Realizing the possibilities of high grade and difficult castings, the company was reorganized under its present name, and acting on Andrew Carnegie's motto, the management started out to "get brains wherever it could find them." This resulted in its securing the services of some of the best and brightest men in the foundry and automobile trades. One step led to another, until today this foundry, although comparatively small, supports a chemical laboratory and metallurgical and foundry staff larger than that found in many concerns melting ten times the tonnage and employing a very much larger number of men.

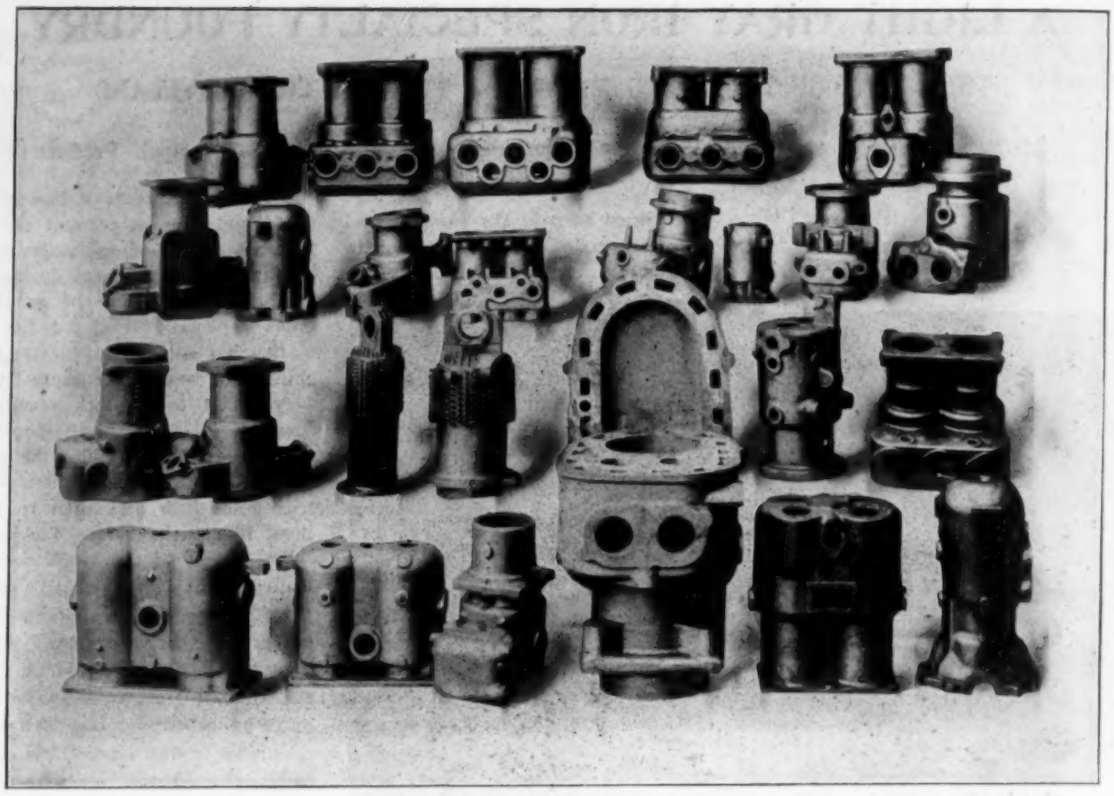


Venting of Jacket Cores.

In order to insure a line of steady work, and also on account of the fact that a machine shop is desirable for certain purposes, it was decided to go into the manufacture of gasoline engines especially designed for marine work. To supply this demand a machine shop has been equipped with the very latest tools, both standard and special. This machine shop is also very handy, as it enables the company to take contracts for difficult and intricate castings and then to machine them before they leave the works.

The range of the work now manufactured may be judged somewhat from the fact that castings are furnished to concerns all the way from Topeka, Kan., to Providence, R. I., and that at least twenty-five different patterns of automobile cylinders are constantly in the sand. One of the accompanying illustrations shows a collection of various types of cylinders turned out from this foundry.

It is a fact worthy of note that no concern would today think of making on the one hand such standard equipment as cap screws, wood screws, etc., while on the other hand no progressive concern would think for a moment of attempting to manufacture its own machine tools of standard types. In like manner the majority



A Number of Cylinders Which are Being Made at the Present Time.

of the foundries are coming to recognize the fact that certain classes of castings are specialties and should be handled by some one making a specialty of that particular class. It is this modern tendency that has brought the plant of the Ferro Machine & Foundry Co. to its present state of excellence.

The production of a perfect casting is the result of a large number of factors operating in harmony. For instance, the intricate cored work required in an automobile cylinder necessitates, first, a careful selection of core sands and binders; second, carefully constructed core boxes, core dryers, core ovens, etc.; third, accurately fitted patterns and foundry rigging, including flasks and other special appliances; fourth, very careful manipulation in melting and in the ascertaining of the proper mixtures of iron to use; fifth, the type of mold, that is, dry sand or green sand.

To meet these different requirements it has been necessary to expend a very large amount of thought and to carry on many exceedingly expensive experiments. In this connection one point of interest is that the company employs an engineer who is in charge of the rigging, his whole duty being to study the work in the foundry and suggest new and improved methods of carrying it on. After any given problem has been studied until the "engineer of methods" believes he has arrived at a correct solution, a meeting of the foundry superintendent, metallurgist, and other members of the general staff is called. The proposed rigging is then thoroughly discussed and this discussion frequently results in decided improvements. In other words, much of the success of this plan is due to good team work.

Ramming Dry Sand Molds.

In many of the large foundries where only a few small castings are required, these small castings may be poured on a day when much large and important work is on the floor, and hence they do not receive proper attention. The result is that three or four attempts have to be made to secure one good casting. In such cases it would be far cheaper to secure the good casting in the first place from such a foundry as the one under consideration, even though the price

charged therefor might seem very high at first. Many large manufacturers are now securing difficult castings, which have to be machined all over and show a perfectly clean surface throughout, from this company.

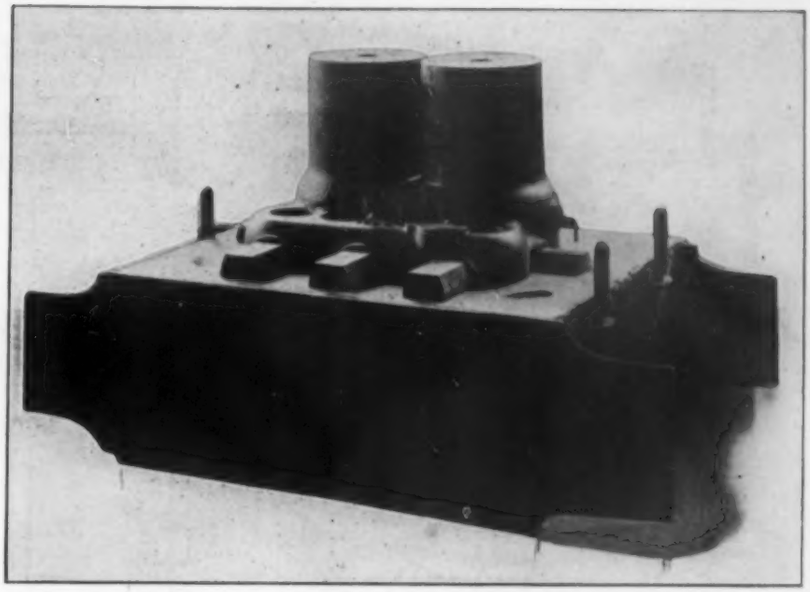
Where any casting is to be turned out in quantity the company prefers to make the patterns and core boxes and employs a force of twenty-five patternmakers covering all classes of wood and metal pattern work.

It is exceedingly difficult to give any comparative statements of the output of such a plant as this, on account of the fact that the tonnage is comparatively small, due to the intricate nature of the work. There are three hundred men employed in the foundry proper. Of this number, seventy-five are coremakers. The original melting equipment consisted of one 60-inch cupola. To this was added a five-ton air furnace. In order to keep pace with the rapid increase in the work, however, it has been found necessary to install a second air furnace of fifteen tons capacity.

ASSEMBLED CORES.

Many of the more intricate cylinders and difficult castings have to be made in dry sand molds. To take care of this work, one mold oven is now in use and a second one under consideration. The core department contains three banks or sets of core ovens which are divided into units with doors on the sides, giving ready access to the various shelves for the placing of core plates into ovens, or for removal of the baked cores. All of the core ovens are being equipped with pyrometers.

It goes without saying that this plant must be equipped with a very good cleaning department, but the equipment in this department is of standard type, consisting mostly of Sly tumbling barrels of the exhaust pattern.



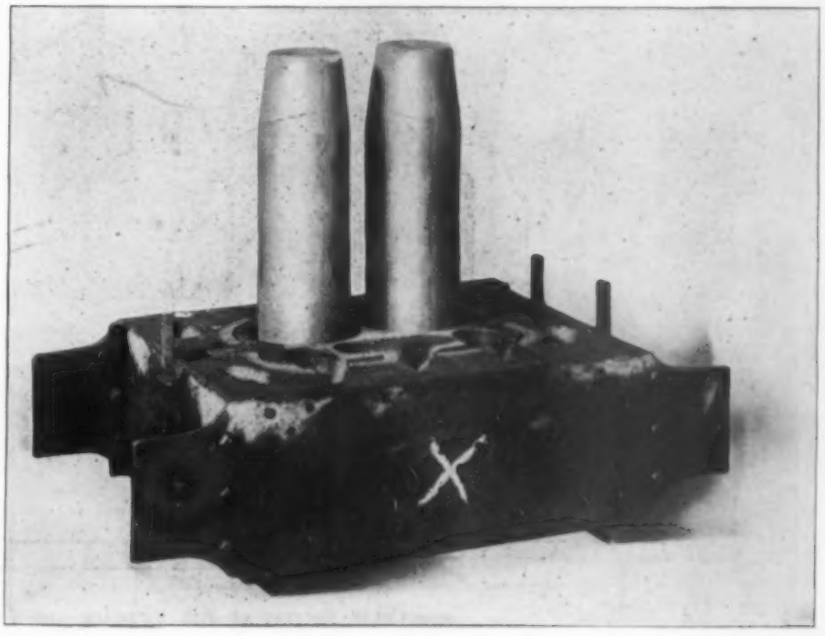
DRAG RAMMED UP AND PATTERN IN PLACE READY FOR THE CHEEK.

One point of interest in connection with the plant is that all power is furnished by gas engines driven by natural gas. These operate electric generators which furnish power for the various operations of the plant.

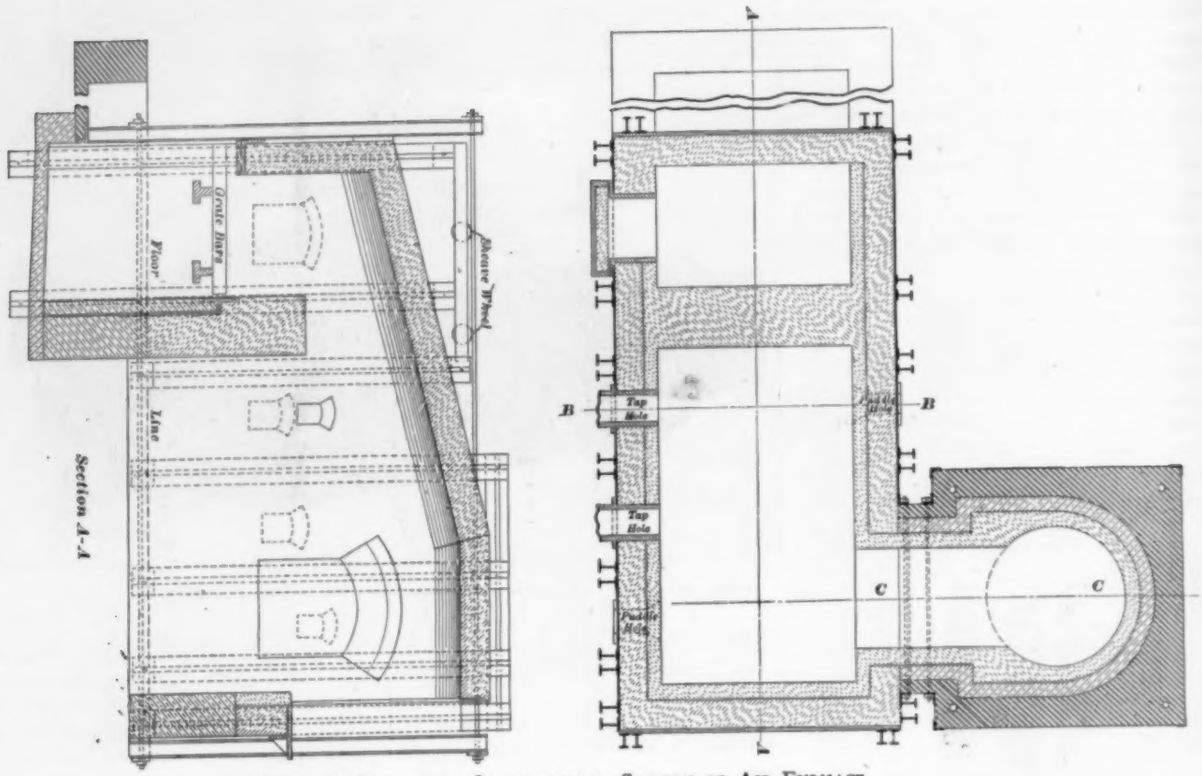
All of the automobile cylinders are tested under 150 pounds hydraulic pressure. All castings are also checked or measured up carefully before being shipped. This latter precaution has been found necessary on account of the fact that several of the contracts being fulfilled require the setting of the cores within a limit of 1-32 of an inch.

Among the specialties which this company is willing to guarantee to supply are light castings not over ⅛ of an inch in thickness which show no chill, but are poured from iron that has a strength of 30,000 pounds per square inch.

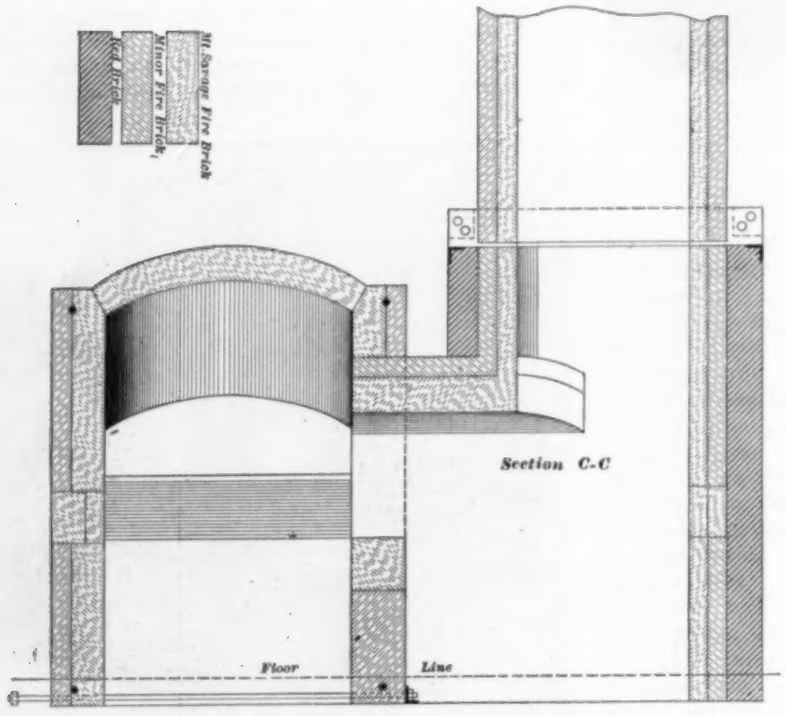
Some idea of the range of cylinders made can be had from the accompanying illustration showing twenty-



DRAG JACKET AND BARREL CORES SET.



SECTIONAL PLAN AND LONGITUDINAL SECTION OF AIR FURNACE.



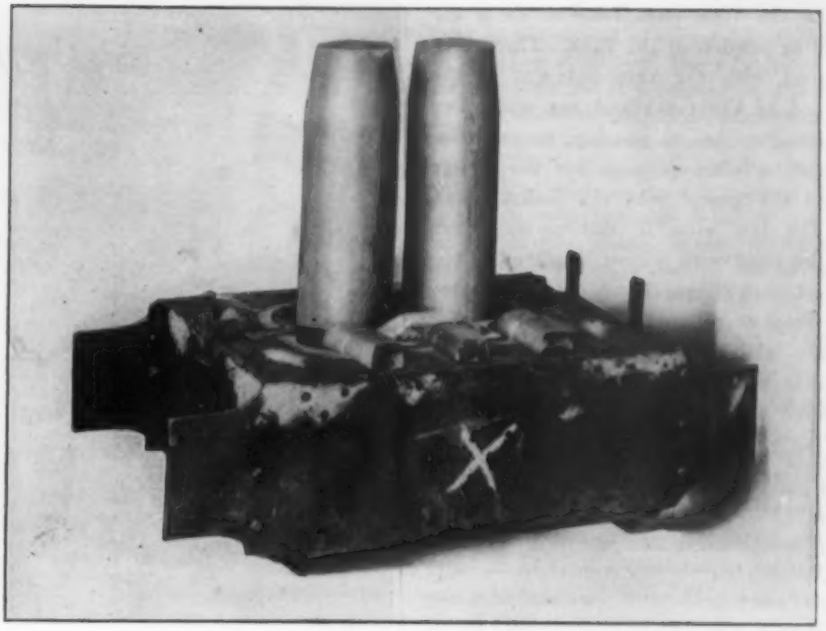
CROSS SECTION OF AIR FURNACE AND STACK

five types which were being turned out at the time the writer visited the plant. One of the other illustrations shows one bay, or section, in the core shop. The core makers work upon benches in front of windows. Back of these benches are situated tables, or benches, upon which the cores are all tested and checked up after they are baked. After the cores have been tested they are passed to storage, or stocked on the shelves as shown at the left of the view.

One interesting feature of the equipment is the press shown on the front end of the table in the center of the picture. This press is used for turning out wax tapers, for venting cores, or for turning out what are known in the foundry as noodles. These are pressed from dough made from flour and water, and are used as illustrated in the assembling of the cylinder molds, as shown in the accompanying illustrations.

The use of the wax tapers for venting difficult jacket core work is illustrated in another view. The core box shown in the lower left hand portion of the view has had the first layer of sand placed in position and the wax tapers adjusted for venting. Some of the tapers are shown at the right of the core box. They are made from paraffin wax and are warmed before use to render them pliable. After the tapers have been placed in the box the balance of the sand is rammed in and the upper portion of the box shown at the top of the view placed in position. One of the completed cores is shown at the right, while in the foreground leaning against the core box can be seen a portion of one of the cores which has been broken open to expose the vents. During the drying process the paraffin is all absorbed by the core sand, thus leaving the vents free or open. The vent is all taken off through the core prints. Of course it is necessary to use a few wires to stiffen such a core, and these are located so that they can be drawn out through one of the cored holes in the finished casting.

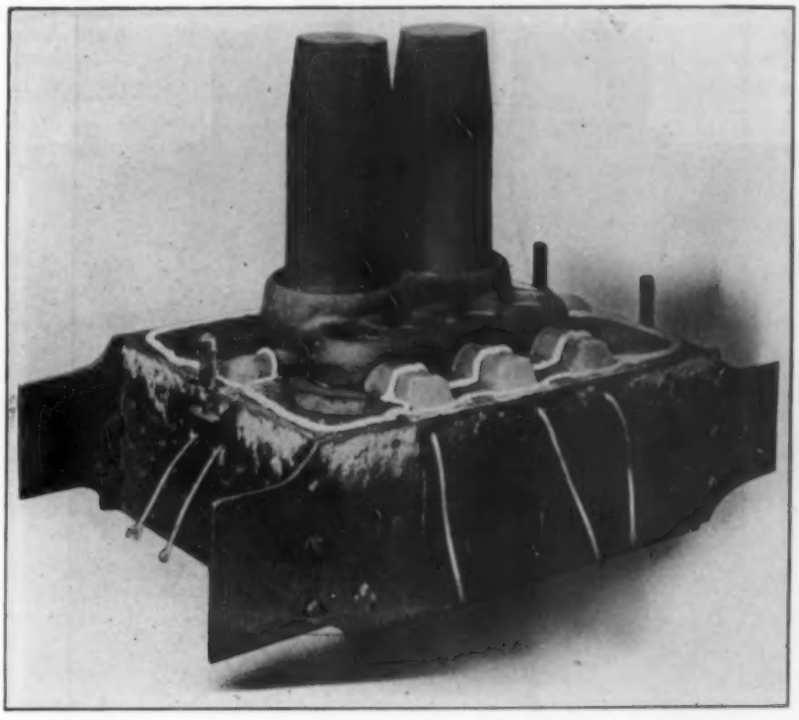
The majority of the more intricate cylinders are cast in dry sand molds. One of the accompanying illustrations shows a gang of four men engaged in putting up such molds, while another of the illustrations shows one of the molds under construction. The drag has been rammed up and the cheek portion of the pattern placed in position ready for ramming the cheek. Especial attention is called to the flask construction. These flasks are made of cast iron plates accurately fitted and bolted together. The plates are perforated to facilitate the escape of the steam during the drying of the molds.



DRAG JACKET, BARREL AND PORT CORES IN PLACE.

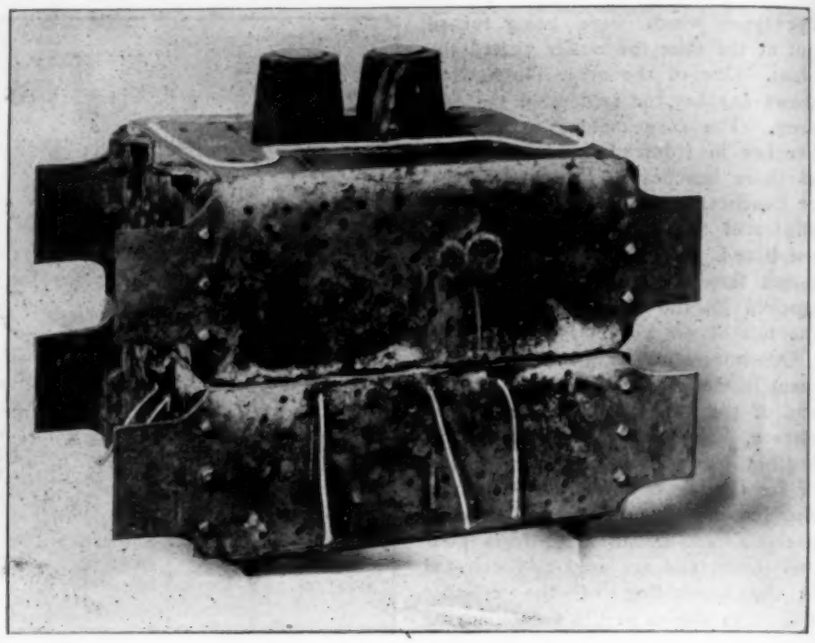
The detailed operations of assembling one of the molds with its cores are shown in some of the other views. First, the cores are shown assembled as they would appear in the mold. Next, the drag portion of the mold with the barrel and drag jacket cores in place is shown. After this the port cores are set as shown in the next illustration.

Next, the upper or cheek portion of the jacket core is introduced and paste "noodles" placed about the joint as shown to prevent any run-out. The cheek is then slipped over as shown in the next view. Attention is called



ALL CORES IN PLACE READY FOR CHEEK.

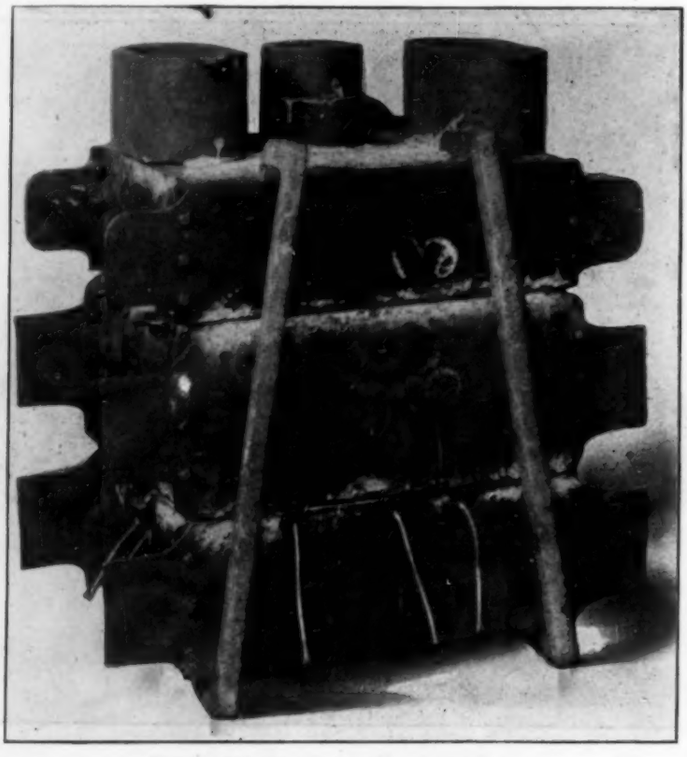
to the rope ends hanging from the drag portion of the flask. These connect with the vent passages at the end of the cores and are withdrawn just previous to pouring, so as to insure a clear passage for the escape of the gases from the jacket cores. The last view in this series shows the mold with a cope in place, clamps set, and runner boxes attached. One thing of interest in connection with the placing of the runner boxes is that each of the down gates is covered with a small square of tin, having a few small holes punched in it, before the runner box is applied. This tin gives a momentary resistance to the metal as it enters and enables the molder to maintain a head in the runner box. The tin melts almost instantly and allows a flood of iron to rush down and into the mold. This quick pouring is found absolutely necessary if accurate castings are to be produced.



CHEEK IN PLACE READY FOR COPE.

One of the other views shows one line of benches on the cylinder floor with the No. 2 air furnace in the background, and another shows the quadruple and twin cylinder floor, with a number of men engaged in placing the runner boxes in position.

The general construction of the No. 1 air furnace is also shown in the accompanying line cut. This furnace was designed by L. G. Blunt, the metallurgist of the plant. The larger or 15-ton furnace, is constructed on the same general lines, though of course the dimensions are greater.

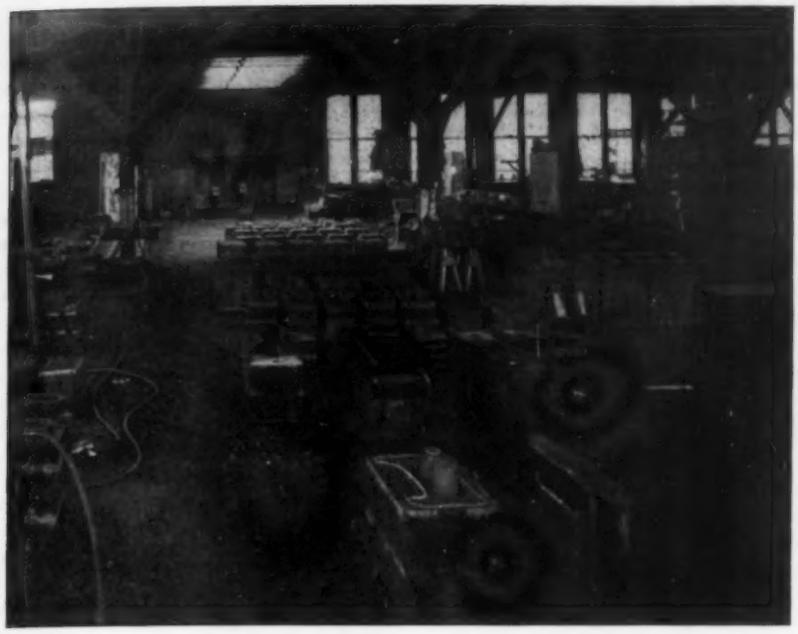


MOLD READY TO BE POURED.

Some advantages of the use of the air furnace for pouring this class of castings are that the entire bath of metal can be brought to the desired composition and tested previous to tapping so that the test bars poured from the heat can be depended upon to represent accurately the composition of the castings poured from the furnace. When pouring from cupola iron, even with the very best of melting, irregularities will often occur which cause the iron to vary greatly between successive tappings.

Another advantage is that in melting in the air furnace, the composition of the iron in regard to certain impurities such as sulphur can be controlled very much more closely.

There is one point, however, which is worthy of mention, and that is, that no one factor in all of the series mentioned can be depended upon to produce perfect castings unless all of the separate factors are in harmony. It is also interesting to note that while the air furnace in the hands of a skillful melter can be depended upon to produce iron of uniformly high grade composition, if the same furnace is placed in less skillful hands, the iron is liable to vary between wider limits than would be the case



ONE LINE OF BENCHES ON THE CYLINDER FLOOR WITH NO. 1 AIR FURNACE IN THE REAR.

with cupola metal. In the cupola, if the proper amount of coke is charged and the blast pressure maintained at the ordinary point, the process is, to a large extent, fool-proof; but with the air furnace this is not true, and comparatively small variations in the treatment of the bath may result disastrously to the product. As stated above, the test bars are the tell-tale which always remain to show how the process is working.

Central Supply Association. — The annual meeting of the Central Supply Association, the membership of which is made up largely of jobbing interests from the eastern Ohio line to the Rocky Mountains, was concluded at Cleveland on Wednesday of last week. John D. Hibbard, of the John Davis Co., Chicago, was re-elected president; S. H. Moore, of the Ahrens & Ott Mfg. Co., Louisville, was chosen first vice president, with George H. Merkel, of Merkel Bros., Cincinnati, as second vice president; Edward F. Neidecken, of the Hoffman & Billings Mfg. Co., Milwaukee, was elected treasurer, and Paul Blatchford, 1524 Tribune building, Chicago, was continued as secretary.

The A. D. Granger Co., New York, in bulletin No. 2 describes the Star water tube boiler. It is a boiler designed for power, steam heating and hot water heating purposes, and is made up to 300 horsepower capacity.

A METHOD OF HARDENING STEEL.

A patent (No. 832,770) on a method of hardening and toughening steel has been granted James Churchward of New York. The process of making a hardened steel plate will show the method and ingredients employed. The same method may be used in making castings for various uses.

The proper quantity of open-hearth steel required should be melted in combination with about one per cent of chromium, one-half of one per cent of tungsten, one and one-half per cent of nickel and about one per cent of manganese. When the mixture of metals is melted, it is poured on a bed or in a mold composed of manganese in the form of a black oxide of manganese. It is only necessary that the manganese shall be on the surface of the mold, where it can come in contact with the molten metal of the casting. When cooled to about a cherry red heat, the casting is removed from the mold or bed and subjected to pressure to reduce it to the required thickness for the plate, the reduction being preferably from about ten to four in order to properly consolidate the mass. The plate may now be trimmed, sized and bored when and where necessary, after which it is heated and immersed in a liquid bath composed of linseed oil, creosote and a small proportion of water, and left in this condition until it cools. The face or part of the metal which was exposed to the manganese bed or mold will be found to be very hard, tough and resistant. The hardness of the face and the depth to which it extends will depend on the length of time the casting remains in the bath.

The American Metal Co., Ltd., of New York, importer and exporter of metals, has increased its capital stock from $2,000,000 to $3,000,000. The new stock was issued to satisfy the requirements of its increased business and has already been paid in.

QUADRUPLE AND TWIN CYLINDER FLOOR.

A NEW COLORIMETER FOR DETERMINATION OF CARBON IN STEEL.[1]

By Charles H. White.[2]

Methods in colorimetry are based on the assumption that the intensity of the color of a definite volume of solution is directly proportional to the quantity of the color-producing substance present. In the preparation and examination of colored solutions, there are three ways in which the depth of color may be varied. These variables are: (1) the quantity of the coloring matter, (2) the quantity of the solvent, or the dilution, and (3) the thickness or depth of that portion of the solution examined. With these three variables as a basis, three general methods of colorimetry have been devised, all of which have been used in the determination of carbon in steel.

In the first method, the quantity of the solution is kept the same for both the unknown steel and the standard, and the sections compared are of equal thickness, while the quantity of the standard is varied until the color obtained is of the same intensity as that produced by a definite quantity of the unknown steel. In laboratories where this method is used, there is prepared and kept for permanent use a series of solutions with varying amounts of the standard, representing the percentages of carbon from the lowest to the highest demanded in that laboratory. These standard solutions are kept in bottles, or test tubes of equal diameter, and are arranged in series from the faintest to the most intense color, so that it is a simple matter to find the place of the unknown steel in the series, when the solution is of a definite volume and is contained in a tube of the same diameter as the standard tubes.

In the second method, equal quantities of the standard and of the unknown steel are dissolved, the standard is diluted to a definite volume, and the solution of the unknown steel is diluted until the colors are of equal intensity in sections of equal thickness. This method is usually carried out by dissolving equal quantities of the two steels in equal volumes of dilute nitric acid, and then diluting in long graduated test tubes of equal diameter until the colors agree when the light passes through the tubes at right angles to their length. The percentage of carbon in each is then proportional to its volume.

In the third method, equal quantities of the two steels are dissolved in equal volumes of the solvent, and the thickness or depth of the solutions under examination is varied until the colors are the same. The percentage of carbon is then inversely proportional to the thickness of the section. This method has been applied to the determination of carbon in steel by pouring varying amounts of the two solutions into long graduated test tubes with flat bottoms, until the colors are of equal intensity when viewed longitudinally from above, the source of light being below the tubes.

Each of these methods has excellent points to recommend it; but, as is well known to experimenters in colorimetry, there are serious objections to all of them, as they have hitherto been applied in practice. In the application of the first method, it seems almost impossible to obtain permanent standards. It is not practicable to keep on hand standards for a wide range of steels; and the standard for one kind of steel will not serve as a standard for a steel of a different kind, or for one that has been subjected to a different treatment. The strongest objection to the second method is the necessity for repeated dilutions by guess, mixing and comparing until the correct volumes are more or less accidentally hit upon. Moreover, if the graduation of the tubes is not marked in such a manner as to correspond in numerical value to the hundredths per cent of carbon present, there is a loss of time in arithmetical calculations. For the third method, the difficulty of obtaining satisfactory apparatus has been serious. A moderately long tube having a flat bottom, with true plane surfaces at right angles to the axis, is

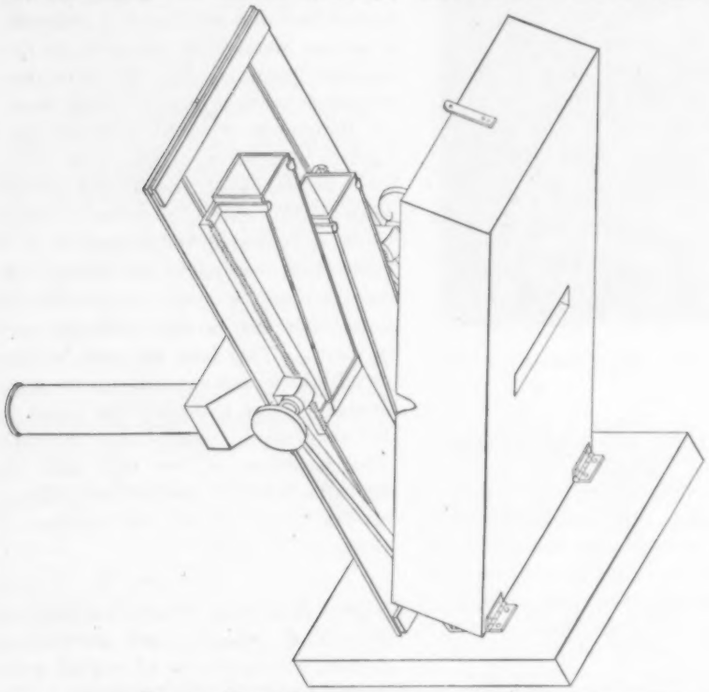


Fig. 1.—New Colorimeter for Carbon Determination.

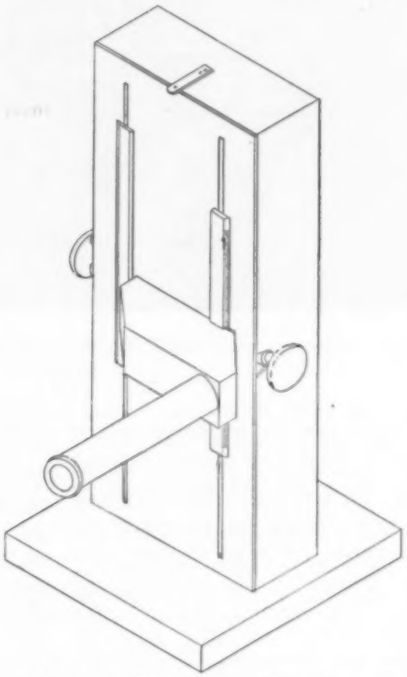


Fig. 2.—Colorimeter Arranged for Use.

[1] A paper presented before the London (July, 1906) meeting of the American Institue of Mining Engineers.

[2] Assistant Professor of Mining and Metallurgy, Harvard University.

made with great difficulty; and if the apparatus is so constructed that the depth of the solution may be increased or diminished conveniently, the emptying and cleaning after each determination renders manipulation necessarily slow.

The colorimeter here described was designed for the rapid and accurate application of the third method, and has proved itself free from many of the objections belonging to those previously devised. In this method, equal quantities of the standard and of the unknown steel are dissolved in equal volumes of the solvent, diluted to a definite volume, and varying thicknesses of the solutions compared until the colors agree; then the ratio of the thickness of the two solutions compared is inversely proportional to the percentages of carbon present. In using this apparatus, the two steels, the standard and the unknown, are dissolved, in the usual manner, in large test tubes, diluted to equal volume, indicated by a mark on the tubes, and the solutions are compared in hollow glass wedges. The wedges must be of equal angle, and it is convenient to have them as nearly as possible of equal size. The large end is left open for the introduction of the solutions, and they are mounted side by side in a vertical position for comparison. Each wedge may be raised or lowered by means of a thumb screw, carrying a pinion which engages with a rack holding the wedge. (Figs. 1 and 2.) The wedges are encased in a box, which is provided with a narrow horizontal aperture in both the front and back, admitting of the direct passage of the light through the wedges in this zone only. In front of the aperture, or slit, are three mirrors, shown in Fig. 3, arranged in such a manner as to render the comparison of the colors easy and exact. The band of color, as observed in mirror, C, through the tube, T, is composed of three nearly-equal parts. The central portion is the color of the solution in wedge, S, reflected from mirror, A, through that portion of mirror, B, from which the silver has been removed. The outer portions of the band of color are from wedge, U, and are reflected from the silvered portions of mirror, B. The racks which carry the wedges carry also graduated scales on the front of the instrument, which show, in every position, the distance from the sharp edge of the wedge to the slit where the comparison is being made. Uniform illumination is secured by admitting the light to the solutions through a pane of ground glass, shown in section in Fig. 3.

In operating this instrument, if the wedges are so adjusted that the colors are of equal intensity, and if their thickness at the slit—the point of comparison—is determined, or the ratio of one to the other is known, it is easy to calculate the percentage of carbon in the unknown steel. Since a longitudinal vertical section of one of these wedges is triangular, and equal in all respects to a similar section of the other wedge, we are not restricted to the measure of the thickness of the solutions to determine the desired ratio, but the length of each from its sharp edge to the point compared the speed and accuracy with which the colors are matched, and the fact that the percentage of carbon is read off directly.

With respect to the best form of wedge, it is evident that, other things being equal, the accuracy of the instrument increases as the angle of the wedge diminishes. But very thin sections of colored solutions are not easily matched, and long wedges are unwieldy and in many ways objectionable. It is not necessary, however, to use the whole length of the wedge; for the standard and unknown steel can not differ greatly in the amount of carbon contained, nor therefore in the colors produced when in solution.

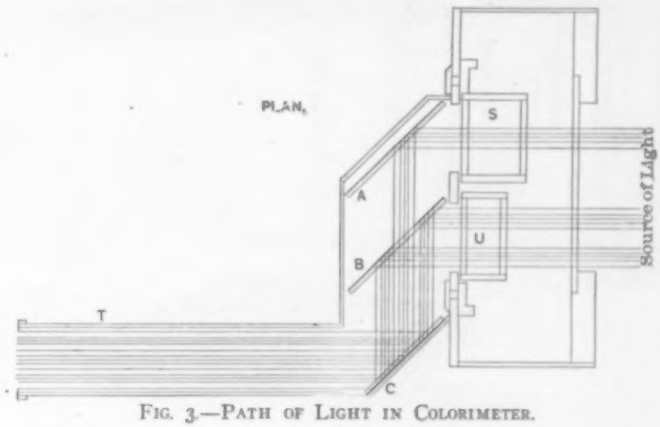


FIG. 3.—PATH OF LIGHT IN COLORIMETER.

may be read off on its graduated scale and used instead.

Suppose, for example, the standard steel has 0.30 per cent of carbon, and, after the wedges have been adjusted by means of the thumb screws until the colors match, it is found that the scale on the side of the standard reads 72 and the scale of the other wedge reads 60; then the proportion (60 : 72 = 0.30 : x) shows that the percentage of carbon in the steel under examination is 0.36. But the solutions in the wedges may be as easily compared at the graduations 30 and 36 as at 60 and 72; and if the scale on the side of the undetermined steel is set at 30 and the other wedge, carrying the standard, is adjusted until the colors are equal, then its scale must read 36—the desired figure.

It is obvious that with this instrument we may vary the standard at will from the highest to the lowest in carbon, and also avoid the difficulties attending attempts at permanent standards; the haphazard diluting required in the second method is obviated, while the wedges are as easily emptied and filled as test tubes. The chief advantages, however, derived from the use of this instrument are The wedges, then, may be designed to have any suitable angle, and only so much of the large end need be used as will afford the range desired. In other words, the wedges are cut off, the lower end of the upper portion sealed, and the lower part discarded. The scales, however, must be graduated to accord with wedges of the full length. Wedges of this type are useful for the most exact colorimetric work, but with the ordinary size shown in the instrument in Fig. 2, comparisons are quickly made and read with accuracy to the second decimal place, which is as accurate as other parts of the color method for carbon in steel can be relied upon to be.

At a recent meeting of the stockholders of the Old Forge Co., Lowville, N. Y., Frank J. C. Steber, of Poland, and John E. Roberts, of Old Forge, were elected directors in place of Dr. A. H. Crosby and Frank C. Doig, of Lowville, resigned. Eugene Arthur, of Lowville, resigned as director, secretary and treasurer, and Mr. Roberts was chosen secretary with Mr. Steber as treasurer.

ALL-STEEL PASSENGER CARS.

The Pressed Steel Car Co., Pittsburg, has recently built a number of all-steel cars for passenger transportation, two of which are shown in the accompanying illustrations. Following the clearly established demonstration of the many advantages as to strength, resistance and ultimate operating economy of the average types of steel freight cars, officers of railways have evidenced a constantly increasing interest in extending a similar form of construction to the passenger and street car fields.

The Pressed Steel Car Co. defines the passenger cars designed and constructed in its new plant at Pittsburg as cars which, while conveying the external contour or appearance of the usual wooden car. are constructed entirely, or for the most part, of steel plates, pressed shapes and commercial sections. By this construction, a vehicle of extreme rigidity is obtained, coupled with lightness and great resistance to shock of collision, fire or other accidents. The first car turned out of the new plant was completed in the spring of the present year for the United Railways of San Francisco. This car is shown in the illustration, Fig. 1, and quite fully filled the terms of the "definition" above. With dimensions corresponding to a wooden car of the same type, it is almost impossible to distinguish it from the latter. The similarity of appearance was obtained by covering practically all the rivets on the outside of the car body with special moldings, and graining all the steel parts, as posts, panels, etc., to conform to the ordinary wood finish. This car is known as the "California" type, and is practically adapted to the climatic conditions of that region. It consists of open sections at each end, with a closed section in the middle, this forming a satisfactory construction for year around service. It seats 40 persons, and the general dimensions are as follows.

	Feet.	Inches.
Length over all	40	6
Length over closed part	13	2
Distance, center to center of trucks	23	6
Width over side sills	7	10½
Width over side sheets at belt rail	8	2¼
Height, top of rail to top of roof	11	8½

The underframes, side sheets, outside finish to eaves of closed section and the platform posts in the open sections are made of steel in the form of plates, rolled or pressed to suit requirements. The interior finish, such as doors, window sashes, floor mats and deck moldings are of wood. The floor is built of 3-32-inch steel plate with one course of wood flooring. The lower and upper deck ceilings consist of steel sheets. The carlines and purlins are made of rolled angles. The underframe consists of six-inch rolled center sill channels. The side sill construction is built up of Z-bars and pressed angle-plates, while the bumper is of eight-inch rolled channel which are pressed to shape.

In order to carry the load and weight of the car entirely on the side construction, care was taken in providing openings for the steps next to the closed car section between the trucks, without weakening the car at these particular points. This was done by placing reinforcing angles along the side of the step opening, extending past the body bolster. The longitudinal seat supports in the closed car section are built of steel plates and angle construction. The body bolster is made of steel truss construction to take Peckham 14-B-33 trucks and 33-inch wheels.

The next cars built in the above plant comprised of three steam railroad cars for the Southern railway, which were described in THE IRON TRADE REVIEW of June 21, together with 40 all-steel passenger car bodies for the Philadelphia Rapid Transit Co. The greater part of these have been completed and delivered. These cars are for service on the Market street elevated and subway lines, and are reproduced in the illustration, Fig. 2. The design is of steel throughout, with non-combustible flooring composition. and to all intents and purposes, the car is shock and fireproof. The outside sheathing is of cold, rolled steel, and the underframe consists of fishbelly side sills, with cross bearers and connections in girder form. The general dimenions are detailed as follows:

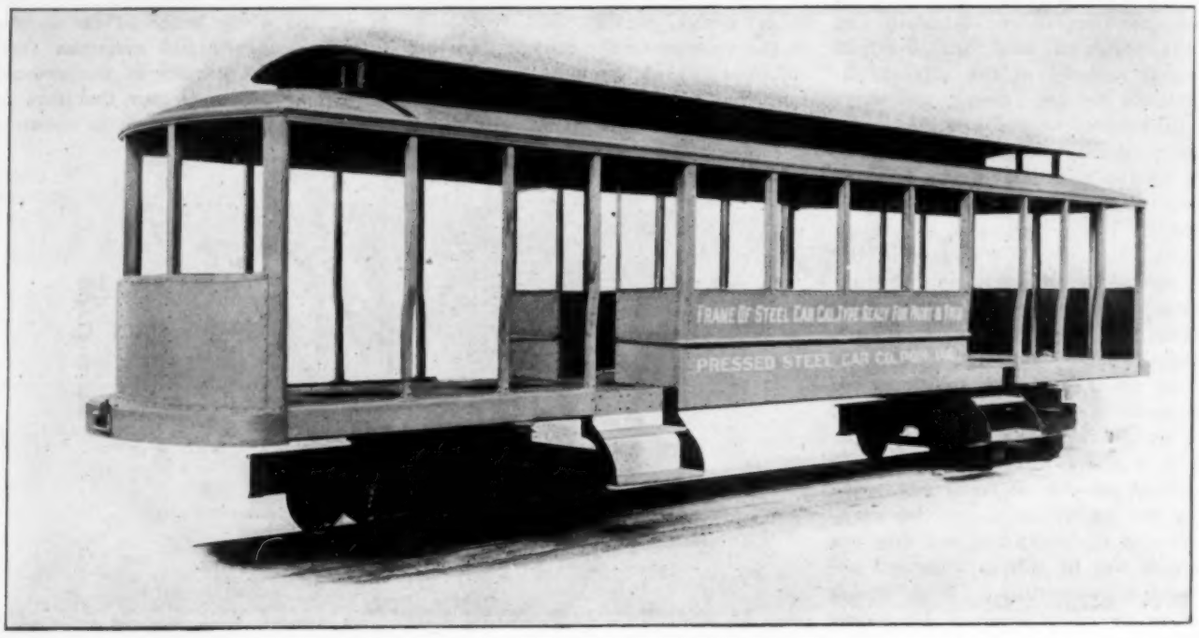


FIG. 1.—FRAME OF STEEL CAR FOR UNITED RAILWAYS OF SAN FRANCISCO.

	Feet.	Inches.
Length over platform	49	7¼
Length over door posts	40	6¼
Length inside car	39	6¼
Width of car outside of side sheets	8	7
Width of car inside	7	7¾
Height from rail to top of floor	3	10
Height from floor to ceiling center	8	6½
Height from rail to top of car	12	7

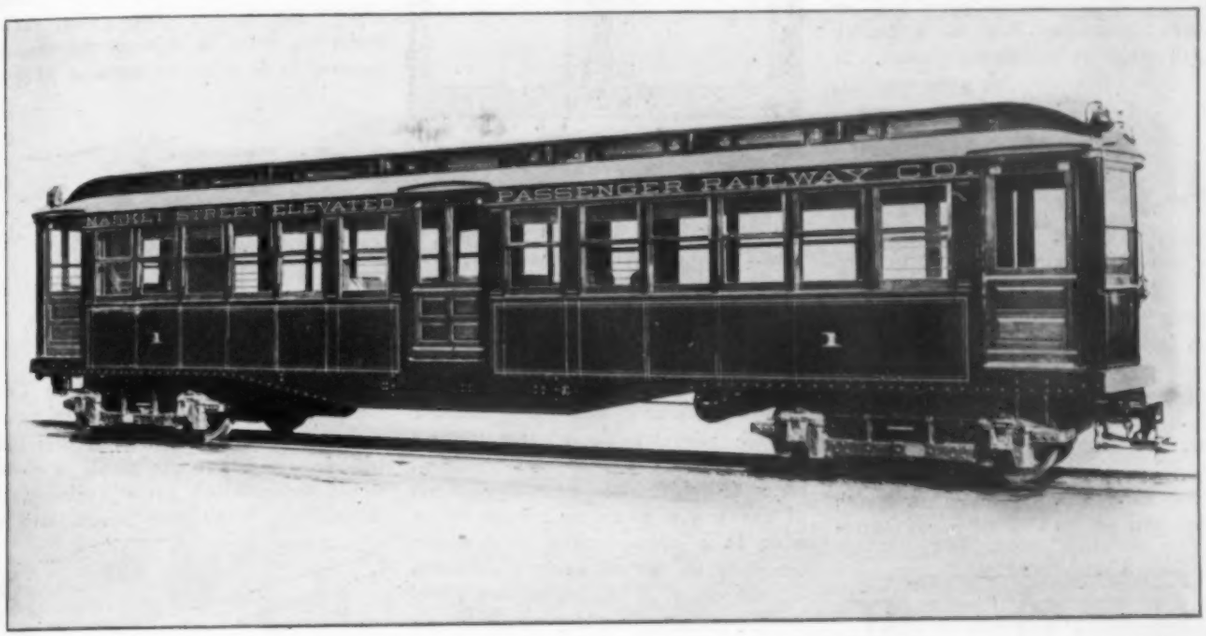


FIG. 2.—STEEL CAR FOR PHILADELPHIA ELEVATED AND SUBWAY LINES.

Opening for vestibule side door (between door posts)	2	9
Width of end door opening	3	2½
Width of side center door opening	3	4
Distance, center to center of trucks	34	6
Width over eaves, upper deck	5	8¾
Width over eaves, lower deck	8	8⅝
Width of vestibule end door opening	2	0

The side doors and those at the center are arranged for opening and closing by pneumatic devices from either end of the car. The vestibule side and center doors have elastic strikers. The underframe is covered with corrugated steel sheets and monolithic flooring composition. The interior finish is of straight-grained mahogany. There are two motormen's cabs on each car at diagonally opposite corners on the right-hand side. The roof is constructed of tongued and grooved poplar, ½ inch thick, covered with eight-ounce cotton duck. The seating arrangements consist of four longitudinal seats for nine persons each, and eight cross seats in the center of the car for two persons each

LOW CARBON VERSUS HIGH CARBON FERRO-CHROME.

In the manufacture of chrome steel, including, of course, chrome nickel, chrome tungsten, chrome molybdenum, and all other chrome alloy steels, the question of the carbon content in the ferro-chromium used is of far greater importance to the steel manufacturer than is generally understood.

The French metallurgists, who have always been very much to the front in investigating the causes of failures of certain steels, have been engaged for some time on the investigation of the variation in the results obtained from alloys of steel in which chromium is used. It was found that whilst one steel would give excellent results at one time, the same steel with exactly the same analysis made in exactly the same way would give bad results at another; and in the case of tool steel, armor-piercing projectiles and similar steels, the difference in the results in some cases was remarkable. These metallurgists made a series of experiments to find out the cause of these differences in the results, and have now abundantly proved that the failures are traceable to the ferro-chromium used in the manufacture of these steels. It is, of course, well known that the carbon present in all ferro-chrome exists, to a large extent, as a carbide of chromium. This carbide of chromium does not all completely dissolve or alloy itself with the steel in which the ferro-chrome is used, but a portion of it remains in the form of crystals of carbide of chromium, causing flaws and defects in the resulting steel. In the case of armor-piercing projectiles, it was found that, in a great many instances, the projectiles would break, and it was also found that the breaking was due to these crystals having caused flaws in the steel.

In pursuing these experiments, the metallurgists had steel prepared by using the ordinary high-carbon ferro-chrome containing various percentages of carbon from two per cent up to nine per cent, or ten per cent, and also from the well-known refined ferro-chrome containing ½ per cent to one per cent maximum carbon, usually averaging about 0.6 per cent, and it was found that in the case of the steel made from the low carbon or refined ferro-chrome that steel was perfect in every respect, and there was no trouble with it as was the case with the steel made from the higher carbon alloy.

The importance of this matter to steel manufacturers making chromium steels cannot be too highly estimated, and there is no doubt that if firms manufacturing armor plates, armor-piercing projectiles, tool steels, and chromium alloy steel of all kinds would use nothing but the low-carbon ferro-chrome, they would get more uniform and better results in every respect.—*The Iron and Coal Trades Review.*

The Krupp works at Essen, Magdeburg, Kiel and Annen in Germany, employ 62,553 persons.

CEMENT BETON SHOP FLOORS AND BEAMS.

BY ROBERT GRIMSHAW.

The use of reinforced cement beton for building purposes has recently assumed large dimensions. This type of construction was first used by Monier and Coignet, who in 1861 employed it for arches, etc.

The employment of iron wire, rods, straps, etc., to strengthen the tension members of constructive parts has so many advantages that it is hardly worth while to recapitulate them. It

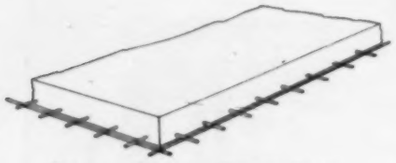


FIG. 1.—CEMENT BETON SLAB.

is only when the fact is forgotten that iron must be used for the tension members and the beton only for the compression that dissatisfaction ensues. The cement protects the iron from rust, and the iron distributes the strains through the cement mass.

The most simple manner in which beton can be used in shop and store-

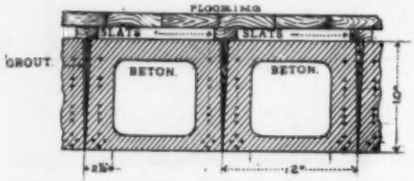


FIG. 2.—CEMENT BETON DEVELOPED FROM SLAB.

room construction is in the form of slabs laid between or across the beams, as in Fig. 1. The rods are ¼ inch in diameter and spaced from four to 12 inches apart. The cross wires should be made fast to the lengthwise rods by fine wire in order to prevent slipping. The slabs are usually made solid, but can be made with lengthwise channels by using gas pipe as cores. The cement mixture should be in the proportions of about one to three or one to four, run rather soft and well tamped. The foregoing is the old Monier type of slab, and requires neither skill nor experience for its construction. All sand used in cement construction should be clear and sharp and ashes and slag should be avoided where heavy weight is to be carried.

A development of the perforated slab is the cement beton, Fig. 2. In this case, the slab is narrower and deeper and there is one large perforation or channel inside of several smaller ones. The blocks are made with a draft on the sides and the wedge shaped interstices are filled with stiff grouting so as to give a full side bearing and a smooth upper surface. It will be noticed that in this

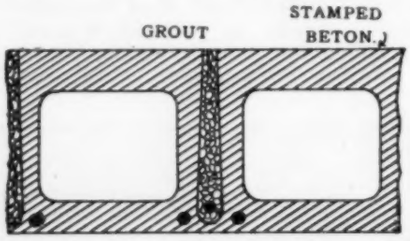


FIG. 3.—BEAMS WITH GROUTED BETON.

construction more wires are used in the lower part than in the upper, which is theoretically correct, the lower part receiving the greater tension. Beams of this construction can be made up to 16 feet in length with perfect safety. The rods to be used should range from ¼ to ½ inch diameter and the number should depend upon the length of span, load to be carried, etc. It is well to carry some of the lower wires up to the upper edge in a curve, particularly where the ends of the beams are anchored to each other or the supporting walls.

Figs. 3 and 4 are the author's own suggestions; in Fig. 3, a large space is left between the beams, which is filled with grouted beton, well tamped in, the rods first having been laid in place and secured. The sides of the beams serve in this case as a mold for the key piece or rather "key beam." In Fig. 4, a cast iron beam is employed and is built into the building. The intermediate beton blocks or

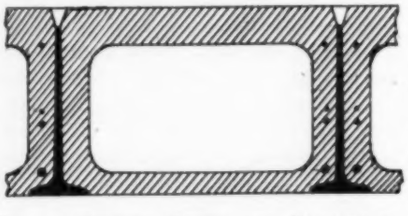


FIG. 4.—CEMENT BETON AND CAST IRON BEAMS.

beams are laid in between. The breadth of the beton beams, that is, the space between the cast iron girders depends upon the load on the floor. The author has merely shown the relations between cast iron girder and the beton beams.

Still another construction is given in Fig. 5. In this, a series of slabs with strengthening ribs of beton serve as beams to carry the slabs and their loads. This construction makes very good use of the cement from the engineer's point of view, giving the maximum strength for a given weight of cement. The mass is bound together vertically by the U-shaped wires, while the cross wires distribute the concentrated loads over the entire slab.

A further development of this idea is given in Fig. 6 the slabs being wider and having three ribs each. From the point of view of the manufacturer, it is more economical to use

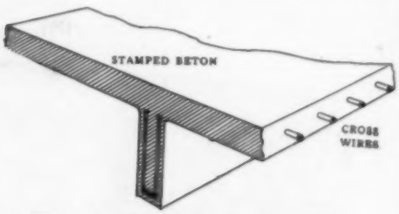


FIG. 5.—CEMENT BETON WITH STRENGTHENING RIBS.

slabs of slight width and only one rib, since they will fit a greater number of rooms of varying widths; but where there is but one width of room to fit through the entire building, it is well to divide this width into a

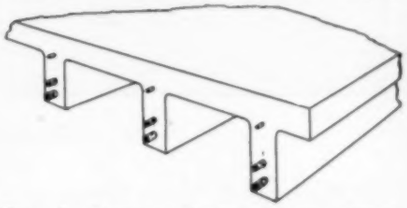


FIG. 6.—CEMENT BETON WITH THREE STRENGTHENING RIBS.

convenient number of equal parts and cast the slabs to this width with two or three ribs each.

Steel Cars For Tunnels. — The Pressed Steel Car Co. has been awarded an initial contract for steel cars for the Pennsylvania railroad tunnels being built between Jersey City and New York city under the North river. These cars will be of the same type as those recently ordered from the American Car & Foundry Co. The cars will cost about $8,000 each and are to be delivered in February.

The American Steel & Wire Co. has completed the movement of the barb wire mesh fence and other standard departments of the Washburn-Moen Works, Worcester, Mass., to the company's plants at Braddock, Pa., and at Newburg, near Cleveland. The Worcester works will hereafter be devoted to special lines and extensive improvements will be made.

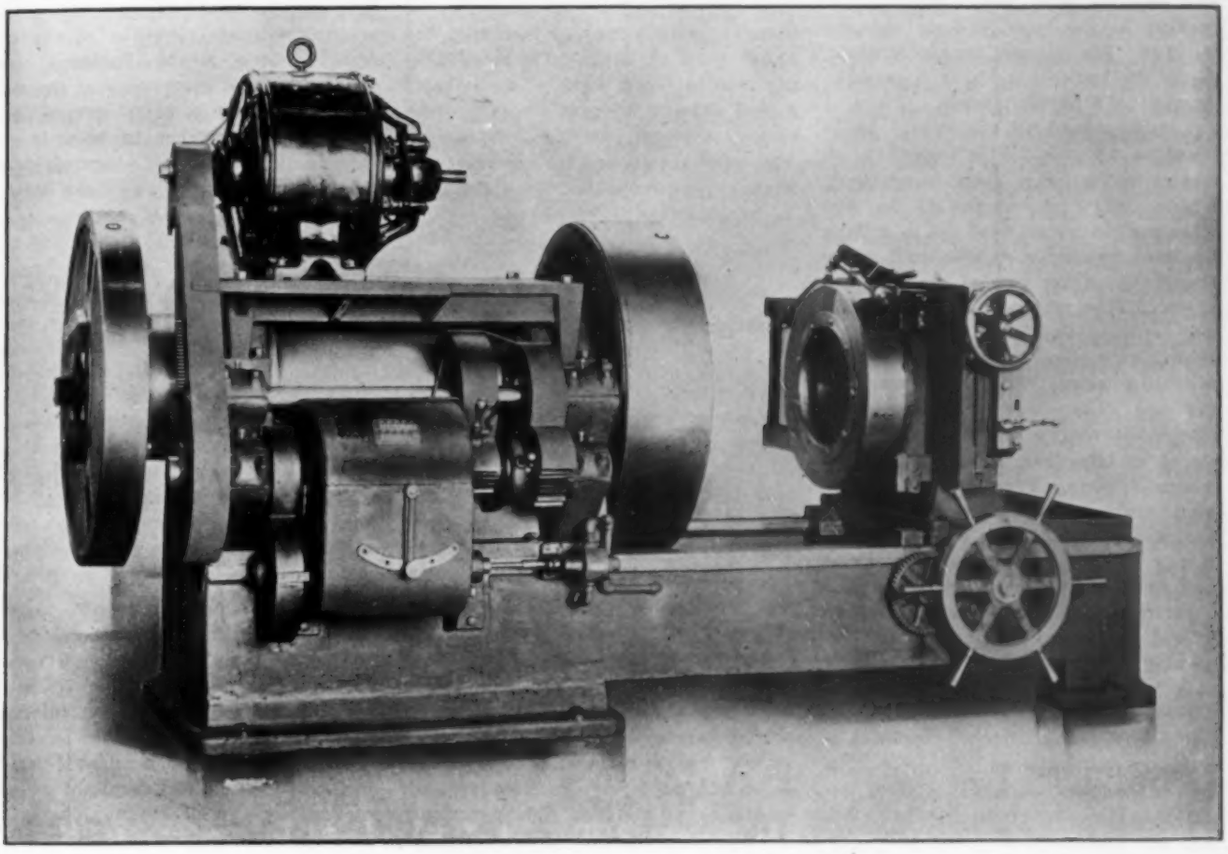
PIPE CUTTING AND THREADING MACHINE.

This tool is the latest type of machine built by the Stoever Foundry & Manufacturing Co. of Myerstown, Pa. It is the No. 12 size and cuts and threads pipe from 4 to 12 inches inclusive. The illustration shows the motor-driven machine but as the belt-driven machine is equipped with but the one pulley, all speeds high in efficiency. A variable speed motor could of course be used if anyone wished to do so and then an additional range of speeds would be secured.

The machine is of massive construction throughout and a departure from the older practice consists in making the headstock in one casting, thus following the usual lathe construction. The gearing is all on the outside of the machine and is readily accessible for any purmechanism is carried on the brackets, and not on the lower shaft, so that there is no tendency towards cutting or binding in the box.

The chucks are of unusually strong construction. The main body of the chuck is a single casting; there are no joints or faceplates to weaken the construction.

The oil for lubricating the dies is furnished by a rotary geared pump of



STOEVER CUTTING-OFF AND THREADING MACHINE.

being obtained in the gearing, there is little difference between the belt and motor-driven types. To equip the machine for motor-drive, the belt pulley is removed and a sprocket wheel for the chain put in its place. The motor table is placed above the main bearings as shown and by the addition of the motor and the chain the equipment is complete.

This method of motor-drive has manifest advantages. In the first place, it permits an easy change from a belt-drive to a motor-drive at any time. The motor-driven machine has all the advantages of speed which are obtained in the belt-driven machine, and without the extra expense and necessary waste of current which accompanies the use of resistance boxes and controllers. With this design a constant speed motor is employed; such a motor being of least first cost, yet pose. An innovation in pipe threading machinery is the use of an internal gear drive, which is powerful, compact, and of course quite safe as the teeth are carefully protected.

The machine has ten speeds, the shifting gear in the gear box giving five speeds and the right and left clutch on the machine provides two for each one in the box. All these speeds can be very quickly obtained; the variations are more easily obtained than by shifting a belt on a cone pulley and making the additional gear changes required in the old machines.

The gear box is oil tight and an arrangement is made for holding oil in the bottom to keep all gears and shafts constantly lubricated. Owing to the particular construction of this box, the weight of the sliding gear and shifting improved construction and this is driven direct from a constant speed shaft on the machine. There can be no slip and necessarily a positive supply of oil is delivered at all times. The actual amount used on the dies and cutting-off tool is regulated by valves at the proper points and the relief valve takes care of any excess.

The die head has been greatly improved by the substitution of interchangeable hardened steel cams for those of the commonly used cast iron construction. This not only ensures a much greater life and accuracy for the head, but if for any reason it should become necessary to replace a cam, it can be very easily and cheaply done. In addition to these hardened cams hardened steel plates are placed in the bottoms of the die slots. These ensure

a permanent bearing for the back edge of the chasers and therefore keep the lead correct, which is a very important point.

The sliding head has been adopted for the regular design as the builder believes it offers many advantages over the older type of stationary head. One advantage lies in the convenience often secured by placing pipe in the machine through the die head, in which case the head can be pushed out of the way and the pipe pushed through the opening in the stand without injuring the dies. The greatest benefit, however, lies in the fact that the head is movable, floating to a certain degree. There is a certain amount of eccentricity to be found in all pipe. This materially increases in the larger sizes, consequently a great strain is brought on the dies when used in a rigid head but by making the head movable it adjusts itself to the eccentricity of the pipe as the latter revolves. This automatic adjustment not only relieves the head of unnecessary strain, but ensures a more equal depth of thread round the circumference of the pipe. The slides for steadying the pipe while cutting off and which are placed on the back of the stand, are unusually heavy. They are made so for what might be called an anvil effect and will withstand the shock of hammering out a large pipe that otherwise may be too much out of round to show a perfect thread. The cutting-off tool is held on one of these slides and the reaming tool is also secured to the same slide.

The carriage is suitably geared so that only a small amount of power is necessary to bring it up to the pipe. The bed is specially designed to give remarkable stiffness between the headstock and the opposite end. The oil reservoir is in the bed and a smaller supply than usual is found ample for necessary lubrication. Evidently it has been the endeavor to design a machine that will be simple in arrangement, the parts thoroughly accessible and easily and cheaply repaired in case of accident. The tool has also been given great strength to withstand the severe service which a machine of this size and kind is required to give if worked to the limit of its cutters. The machine complete with equipment weighs about 10,000 pounds.

The rolling mills in Youngstown are having an unprecedented run and orders are coming in briskly. It is rushing the skelp mills at the plant of the Youngstown Sheet & Tube Co. to their utmost capacity to keep up with the tube mill where all of the output is used.

WELSH IRON AND STEEL PRODUCTION INCREASING.

D. W. Williams, consul at Cardiff, reports increased activity in the production of iron and steel throughout Wales.

There were 483,031 tons of pig iron produced in Wales and Monmouthshire during the first six months in 1906, an increase of 4,220 tons over the output for the corresponding period in 1905. The production by classification was 39,504 tons of forge and foundry, 398,881 tons of hematite, and 44,646 tons of basic. The output of pig iron in Great Britain in the same period showed a much larger proportion of increase, for the total output was 4,905,424 tons, an increase of 283,824 tons compared with the first half of 1905. It appears that 157,760 tons of British pig iron were exported to the United States during the eight months ending Aug. 31, and that 4,038 tons of American iron were imported during the same period. The British pig iron industry is largely dependent upon foreign countries for its supply of iron ore, the imports for the first eight months of 1906 exceeding 5,000,000 tons, of which Spain furnished by far the larger per cent.

There were 436,877 tons of open-hearth steel ingots produced in Wales and Monmouthshire during the first six months in 1906, an increase of 15,160 tons, as compared with a like period in 1905. Of the output 333,291 tons were acid and 103,586 were basic. Wales retained its rank as the third producing district in Great Britain, where the total output during the same period was 2,196,853 tons, an increase of 216,758 tons over the first half of 1905, with 375 furnaces in operation. Wales produced only 58,666 tons of plates and angles, 35,658 tons of blooms, and 8,819 tons of steel rails, but it ranked first in the production of bars, including tin plate bars, for its output was 355,834 tons of the total of 493,981 tons produced in Great Britain.

THE BARD ADJUSTABLE BUSHING.

The Armstrong Mfg. Co., Bridgeport, Conn., has placed on the market the Bard adjustable bushing for use with the Armstrong die stock. The bushing is made in four sizes, each taking the same range of pipe as the corresponding number of the stock. The bushing is shown in the illustration attached to the stock. It consists of a strong, malleable iron body with a sleeve fitting into the barrel of the stock. A twist of the cam plate brings a set of hardened jaws against the pipe, centering it at the same time. The cam plate is secured by a thumb screw insuring an accurate and straight thread. These adjustable bushings are designed to avoid the loss or misplacing of ring bushings, together with the time occupied in searching for and fitting them to the stock. There is no necessity of carrying an extra set of bushings in the kit. When an adjustable bushing has been fitted to the stock, the bushing need not be removed from the stock after fitting, and there are no parts of it to get out of order.

BARD ADJUSTABLE BUSHING.

Steel Ships for Lumber.—The steel steamer Charles Beatty recently arrived at Detroit with 1,200,000 feet of hemlock lumber, setting a new record for the port. It is said that the Beatty is probably the first steel steamer to be consigned to Detroit with lumber, and is one of the few steel steamers in that trade on the lakes, though the prediction is made that the time is near when wooden boats will be rapidly superseded by steel freighters for the lumber traffic.

At a recent meeting of the regents of the University of Colorado the name of the department of engineering was changed from the School of Applied Science to the College of Engineering of the University of Colorado. Professor M. S. Ketchum continues as dean.

ELECTRICAL FURNACE METHODS OF IRON AND STEEL PRODUCTION.—V.

By John B. C. Kershaw.

The Stassano Furnace and Process.

The Stassano furnace and process for smelting iron ore by the aid of electrically generated heat is the oldest of those described in this series of articles, the first patent having been granted to Stassano, then a captain in the Italian artillery in April, 1898.

The early experiments were made at Rome in the year 1899, and the results of these having been looked upon as promising, a company was formed to exploit the furnace and process upon an industrial scale of operations, a plant capable of utilizing 1,500 horsepower being planned for erection at Darfo in northern Italy. This plant was partially completed, and the Stassano furnace was seen in operation there, in 1901, by Dr. Hans Goldschmidt, of Essen, who prepared an official report upon it for the German patent office. The company controlling this development unfortunately exhausted its financial resources before the furnace or process had become a success from a commercial point of view, and the operations at Darfo ceased in the following year. The Italian government, however, arranged with the inventor to carry on the experimental work with the process at the Royal Arsenal, Turin, and the Canadian commissioners inspected the furnace at this place in March, 1904. The refractory roof of the furnace had fallen in some time before their visit, and as there had been some delay in obtaining the materials for its repair, the commissioners were not able themselves to witness the furnace in operation.

The experiments with the Stassano furnace are, however, being continued by the *"Formi Termoelletrici Stassano."* at Turin, and according to the most recent information kindly given by Major Stassano, to the author, a plant of four furnaces capable of utilizing 2,300 horsepower is now under construction at this place. The plant is to include two furnaces of 1,000 horsepower each,

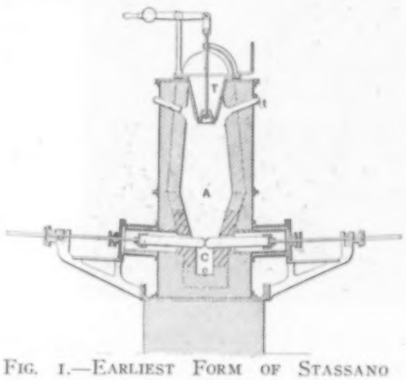


Fig. 1.—Earliest Form of Stassano Furnace.

and two smaller furnaces of 200 horsepower and 100 horsepower respectively, one of the larger and one of the smaller furnaces being of the rotating type. At the date of Major Stassano's letter (July 11, 1906), only the two smaller furnaces had been completed and were in regular operation.

The Stassano furnace is not to the author's knowledge in operation in any other place than Turin, and on this account, the furnace and process must be regarded as still in the earliest stage of their industrial development. As the oldest of the electric furnace methods of iron and steel production and one possessing some peculiar features in design, the Stassano furnace and process are, however, worth, some attention and study by electro metallurgists, more especially as very pure iron and steel can be produced in it.

Fig. 1 shows the earliest form of furnace designed by Stassano, this being what is called by the inventor the *fixed type*, in contrast with the *rotating type* which he designed and patented later. Fig. 1 shows a furnace constructed on the blast furnace principle, with two solid carbon electrodes in the throat of the furnace above the hearth. The ore, coke and fluxing materials were charged into the hopper *T*, and these were heated as they traveled downwards, by the hot gases rising from the lower part of the shaft and passing away at *t*. The actual reduction of the ore occurred in the neighborhood of the electric arc at *C*. This furnace was tried at Rome and at Darfo, but it was soon discarded for the rotary form of crucible furnace shown in Figs. 2 and 3. This furnace was of the arc type, and consisted of an outer cylindrical casing of iron lined with magnesite, and surmounted by a dome-shaped roof. The raw materials were charged into this furnace by the hopper at *D*, these being first ground and then mixed and formed into briquettes,—the heating occurred by radiation from the arc between the two carbons at *A*;—and the electric connections were arranged for by the annular ring and brushes at *C*. The carbons were water jacketed, and their movement was controlled by hydraulic power. The molten metal was discharged at *E*, and the slag at *F*.

This furnace could be rotated about its axis with a movement of seven degrees from the vertical, and the charge of ore or scrap upon the hearth was thus subjected to a mixing movement

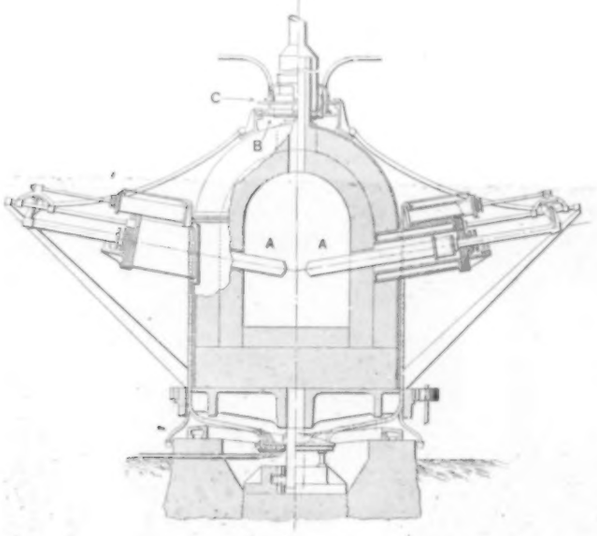


Fig. 2.—Stassano Rotary Furnace, First Form.

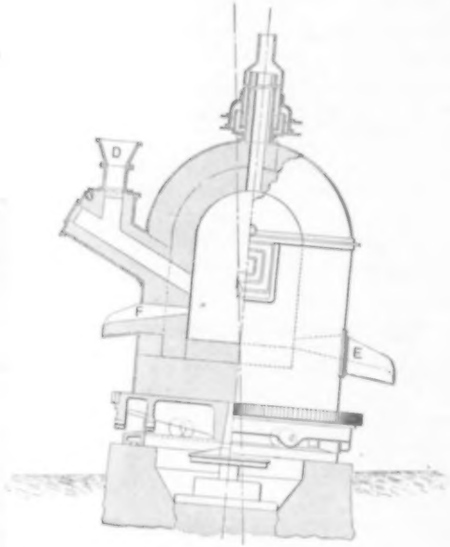


Fig. 3.—Stassano Rotary Furnace, First Form.

during the melting and refining process. Stassano claimed for this form that it satisfied all the requirements of a perfect iron or steel electric melting furnace—these being in his opinion as follows:

1. The exclusion of air, and presence of a neutral or inert gas in the melting chamber.
2. A very high temperature.
3. No contact of the raw materials or molten iron and steel with the carbons or electrodes.
4. Machinery always under full load when in operation.

This was the form of furnace used by Dr. Goldschmidt in his experimental trials with the process at Darfo in 1901,—and from these trials the following figures were obtained:

The furnace was rated at 80 killowatt capacity, and normally absorbed 1,000 amperes at 80 volts. The charge of 70.25 kilograms (155 pounds) consisted of ore, coke and limestone in the following proportions:

Iron ore 1000. } Limestone 125. Carbon 160.
Additions 120. }

The reduction of the charge was completed in 2 hours, the electric current being gradually increased to a maximum of 1,000 amperes at 100 volts, and then correspondingly reduced, and increased again, towards the end of the operation.

The power consumed was 97,200 watt-hours, or 132.44 electrical horsepower, and the product obtained weighed 30.8 kilograms (77.88 pounds). This was equivalent to 4.3 electrical horsepower-hours per kilogram of iron, and Goldschmidt calculated that it represented a furnace efficiency of 61 per cent. The iron and steel produced in these experimental trials of the Stassano furnace at Darfo was exceptionally pure, the percentage of carbon being reduced as low as 0.04, and only traces of silicon being found in some of the finished metal. Goldschmidt estimated as a result of his study of the process, that one metric ton (1,000 kilograms) of steel could be made in a plant producing 30 tons of steel per 24 hours by the Stassano method, at a cost of 75.20 marks, equal to $18.80 per ton.

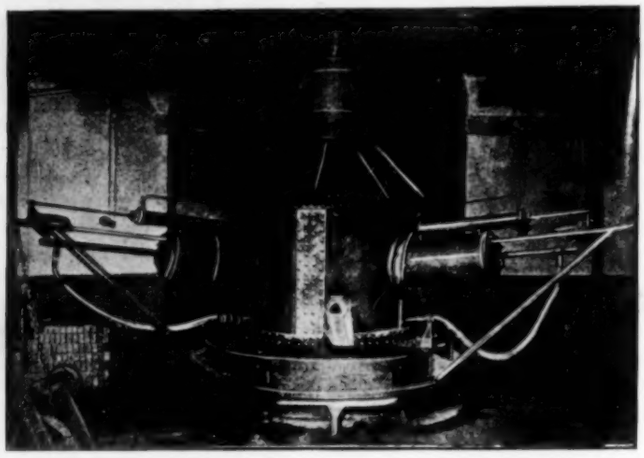


FIG. 4.—200-HORSEPOWER STASSANO ROTARY FURNACE, WAR OFFICE TYPE.

The power in this estimate was taken at the low cost of 36.5 marks per electrical horsepower-year.

Although Goldschmidt's report was favorable to the continued operation of the Stassano plant at Darfo, the work was not a success, and the company financing this venture was obliged to go into liquidation and to sell the furnaces and other plant.

The modified form of rotating furnace which was erected by Major Stassano for the Italian war office at Turin, seems to have been more successful. This furnace is shown in Figs. 4 and 5. The furnace has three carbon electrodes in place of two, the distance of these apart and length of the arcs, being regulated as before by hydraulic cylinders actuated by water pressure. A three-phase current of 90 volts and 400 amperes is used to work the furnace. Either iron or steel can be made in this furnace as desired, the raw materials being chosen and their amount calculated, according to the product desired. At Turin the furnace is used for making mild steel for shot (i. e. for shell) from iron and steel scrap. In a letter dated April 12, 1906, the Director of the Royal Arsenal states that after two years' experience, they are perfectly satisfied with the application of the furnace to this purpose.

According to the same authority, the furnace has a capacity of 2,500 kilograms (5,510 pounds) of steel per 24 hours, and consumes for each charge of 625 kilograms (1,377 pounds) of steel, 850 kilowatt-hours of electric power, in the form of three-phase current at a pressure of 80 volts between the phases. The power consumption is therefore 1.36 kilowatt-hours per kilogram of steel, equivalent to 1.85 electrical horsepower-hours, a distinct improvement upon the Darfo results. Stassano has, however, pointed out that the power consumption is much lower when melting scrap, than when reducing iron to the metallic state from its ores, and has explained the cause of this. Fig. 6 shows the switch-board and electrode controlling valves of the Turin arsenal furnace.

The inventor gives the following estimate for the 1,000-horsepower furnace of this type which is now being erected at Turin by the *"Forni Termoelletrici Stassano."*

Cost of furnace .....25,000 francs
Output per day ..... 4 to 5 tons

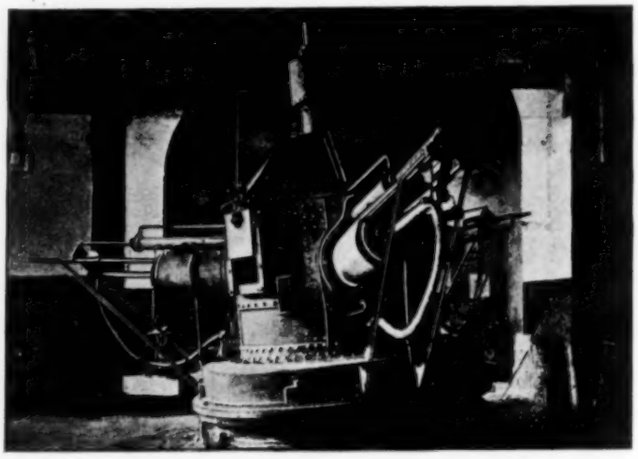


FIG. 5.—200-HORSEPOWER STASSANO ROTARY FURNACE, WAR OFFICE TYPE.

Current ..... 4,900 amperes
Voltage 150
Electrodes..... 4 in number, each 1.50 meters in length and 15 cms. diameter

Consumption of electrodes..10 to 15 kilograms per ton of steel.
Arcs .....two, each taking 2,450 amperes
Lining ..... Magnesite brick

Although this furnace has not yet commenced work, Major Stassano believes that the use of four electrodes will lead to notable economy in production, since it will be possible to use one or two arcs, according to the amount of heat required at the various stages of the reduction process. In order, however, to keep the electrical machinery at full load, an essential condition of economical work, (see above) it will be necessary to operate two of these furnaces in combination, and to arrange that one shall be taking the maximum current, when the other furnace is taking its minimum requirement of electrical energy.

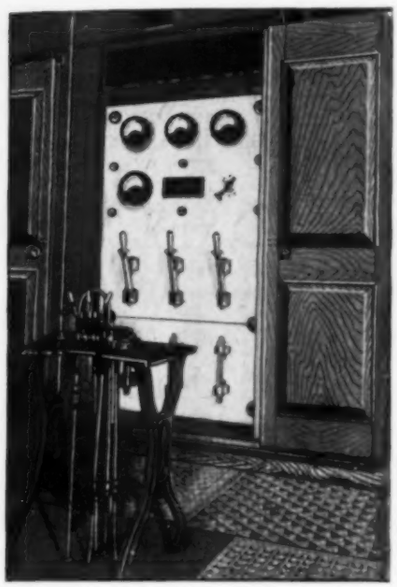


FIG. 6.—SWITCHBOARD FOR CONTROLLING STASSANO FURNACE.

In order to still further reduce the energy consumption per ton of finished iron and steel Stassano is now experimenting with the new type of furnace shown in Fig. 7. This furnace resembles in some respects the ordinary Martin steel refining furnace, and has a fixed hearth with two or three pairs of carbon electrodes for heating the charge of metal by arc radiation. No details of the method of work in this furnace, nor of the results obtained with it, have, however, yet come into the writer's hands.

The following are figures showing the chemical composition of the iron made directly from the ore, in the rotating type of Stassano furnace.

	1	2	3	4	5
Iron	99.64	99.70	99.69	99.74	99.76
Mn'gnese	.106	.095	.109	.083	.092
Silicon	.048	.022	.028	trace	trace
Sulphur	.073	.062	.046	.065	.059
Phs'ph'rs	.0055	.024	.013	.0016	.009
Carbon	.120	.092	.113	.091	.090

The power consumption in these runs varied between 7.00 and 4.22 electrical horsepower-hours per kilogram of iron produced, the lowest consumption being obtained in run No. 5.

In a paper contributed to the Faraday Society in April, 1906, Major Stassano gave some figures for the work of the 200-horsepower furnace erected by his company at Turin, which are an improvement upon any yet published. When in use for refining scrap and pig iron, the consumption of electric power by this furnace varied between 1.1 and 1.3 kilowatt hours per kilogram of steel or iron produced,—this being equivalent to 1.5 and 1.76 electrical horsepower-hours per kilogram of iron. The yield of the furnace was stated to be 2.4 tons per day of 24 hours. The worst feature of this furnace was the wear and tear on the refractory linings; the author estimated the cost of the renewal of these at 10 francs per ton of metal produced.

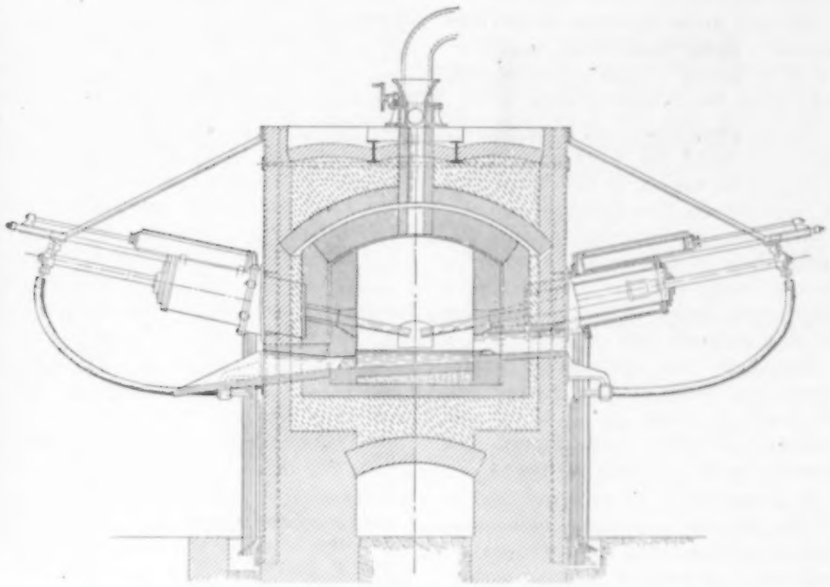


FIG. 7.—STASSANO FIXED FURNACE, NEW TYPE.

A PENNSYLVANIA TERMINAL CONTRACT SECURED.

The Jobson-Hooker Co., Pittsburg, has recently secured a contract from the New York Contracting Co. for all of the structural erection of the Pennsylvania terminal station at New York up to the street level, generally conceded to be one of the largest erection contracts ever let in this country. In the street supports alone there is involved between 25,000 to 30,000 tons, and the substructure will likely amount to as much more. The street support contract in itself is a large undertaking, in as much as it comprehends the building of heavy steel viaducts under Seventh and Eighth avenues, between 31st and 33rd streets, the support of Ninth avenue throughout the same length and practically the building up on steel of 31st and 33rd streets between Seventh and Ninth avenues. The heaviest weights to be handled run close to 60 tons each, being girders to be placed in the throats to cover subway approaches through 32nd and 33rd streets to the east of Seventh avenue. Work was first commenced on Aug. 22 at the south end of Eighth avenue, and already the Eighth avenue viaduct has reached a point midway across the property.

The Jobson-Hooker Co. is a young concern organized out of the Pittsburg Steel Construction Co., of which Howard M. Hooker was formerly vice president, and John Jobson superintendent. Previous to securing the above contract it has been steadily at work for two years or more on the caissons and shields for the East river tunnels of the Pennsylvania railroad at New York and Long Island City. The caissons and shields were conceded to be two of the most involved field erection problems ever developed; the caissons in themselves presented a serious proposition in the shape of riveting, some 680,000 rivets having been driven in the course of their erection, and the record made on them of 1,500 rivets driven by one gang in one day stands by itself. The shields, ten in number, presented more than the usual number of obstacles in erection, as they were assembled at the bottom of shafts of considerable depth in a very contracted space, and in one instance a large shield was erected at a distance of about 2,000 feet within the tunnel.

Coke Ovens of Western Pennsylvania.

List of Those Making Coke from the Pittsburg Seam.

An editorial in THE IRON TRADE REVIEW last week called attention to the exhaustion of some of the coal seams in the Connellsville district. We are enabled to present figures this week, showing the number of coke ovens in the various sections in October, 1906, together with the number burning, out, and building, also the number in the various districts in April, 1905.

The list given herewith covers the present coking field from south to north, referring to the ovens making coke from the Pittsburg coal.

The sections numbered from 6 to 11 inclusive, cover the older part of the Connellsville region, in which the coal is very rapidly becoming exhausted.

It will be observed that in these districts there is practically no increase in new ovens, while on the other hand many ovens active in 1905 are now out of blast through lack of coal.

During the year 1907 a much greater number of ovens in this district will be forced to close down through exhaustion of their coal supply, the number being variously estimated.

A person high in authority in one of the largest producing companies, admits an impending loss of 1,500 ovens, while an eminent railroad authority, having to do with the transportation of coke in this region, estimates the loss during 1907 will be 3,500 ovens. This, however, must be largely a matter of surmise, as it is very difficult to estimate the remaining amount of coal in a mine when the same is nearly worked out.

1.—Uniontown-Smithfield District.

Plant.	April, 1905. Ovens.	Oct., 1906. Ovens.	Out.	Burning.	Building.
Ada	40	40	40		
Acheson	138	138		138	
Crystal	100	100		100	
Sackett	30	30		30	
Rich Hill	56	100		100	
Burchinal	16	16		16	14
Baxter		20		20	
Bourne	86	86		86	
Penn	82	82		82	
Gilmore	50	100		100	
Thomas	40	40		40	
York Run	420	420		420	
Shoaf	300	300		300	
Kyle	306	306		306	
Wynn	130	130		130	
Oliphant	252	252		252	
Crossland	100	120		120	
Redstone	445	445		445	
Leith	308	308		308	
Smiley	...	...		...	300
Total	2,899	3,397	40	2,993	314

2.—Monongahela River District.

Martin	135	195		195	
McKeefry	132	202		202	
Sunshine	50	150		150	
Donald	222	402	20	382	
Virginia	134	160		160	
Husted	...	100	40	60	
La Belle	200	200		200	
Griffin	459	499		499	
Sterling	...	30		30	170
Total	1,332	1,938	60	1,878	170

3.—West Uniontown, or Klondyke.

Continental No. 1	400	400		400	
Continental No. 2	300	326		326	
Continental No. 3	300	300		300	
Newc'm'r	30	30		30	
East Conn.	...	52	52		
Messmore	...	50	24	26	
Fretts	...	80		80	
Parshall No. 1 & 2	132	200	40	160	
Annamyra	32	32		32	
Leckrone	516	516		516	
Emery	...	32		32	
Plumer	...	60	20	40	
Revere	650	650		650	
Footedale	400	400		400	
Buffington	400	426		426	
Shamrock	200	200		200	50
Low Phos	150	250		250	
Low Phos No. 2	...	...		...	200
Solon	...	40		40	
Taylor	...	200	100	100	
Struthers	...	160		160	
Orient	300	400		400	
Republic	...	144		144	256
Century	54	68		68	132
Brier Hill	370	450	40	410	
Lambert	432	460		460	
Edenborn	500	500		500	
Byrne	20	20		20	
Total	5,186	6,446	276	6,170	638

4.—Redstone Creek District.

Edna	35	35		35	115
Lafayette	220	220		220	
Lincoln	319	400		400	
Colonial No. 1, 2 & 3	402	610		610	252
Cyrilla	50	90		90	
Hero	30	30		30	
Total	1,056	1,385		1,385	367

5.—Washington Run District.

Wash. 1	320	384		384	116
Wash. 2	381	500		500	
Echard	...	44		44	16
Perry	...	30	30		
Total	701	958	30	928	132

6.—Uniontown-Connellsville District.

Oliver No. 1	328	328		328	
Oliver No. 2	480	480		480	
Oliver No. 3	300	300		300	
Chester	54	54		54	
Florence	20	20		20	
Mt. Hope	80	...	80		
Leisenring No. 2	500	500		500	
Bittner	200	200		200	
Elm Grove	218	218		218	
Juniata	250	250		250	
Stewart	155	155		155	
Lemont No. 1	227	227		227	
Lemont No. 2	350	350		350	
Youngst'n	241	241		241	
Percy	60	20	40	20	
Mt. Braddock	400	280	160	280	
Atlas	302	302		302	
Mahoning	208	...	208		
Trotter	464	464		464	
Leisenring No. 3	504	504		504	
Leisenring No. 1	500	500		500	
Total	5,841	8,715	488	5,393	

7.—Connellsville-Dawson District.

Adelaide	375	375		375	
Ft. Hill	186	186		186	
Paul	489	439	50	439	
Nellie	329	329		329	
Clarissa	108	108		108	
Rainey	185	185		185	
Spring Grove	61	61		61	
Shannon	...	30		30	
Sterling 1 and 2	150	80	70	80	
Total	1,883	1,793	120	1,793	

8.—Broad Ford-Scottdale District.

Tyrone	...	30		30	
Henry Clay	120	120		120	
Frick	105	105		105	
Morgan	165	165		165	
Foundry	97	97		97	
Eagle	80	...	80		
Summit	100	...	100		
White	200	146	54	146	
Tiptop	121	121		121	
Franklin	50	50		50	
Total	1,038	834	234	834	

9.—Connellsville-Scottdale District.

Davidson	333	333		333	
Coalbrook	120	120		120	
Grace	408	278	130	278	
Pennsville	90	90		90	
Valley	251	251		251	
Home	20	20		20	
Total	1,222	1,092	130	1,092	

10.—Scottdale-Tarr District.

Enterprise	48	48		48	
Union	72	60	12	60	
Alverton No. 1	252	252		252	
Alverton No. 2	104	104		104	
Southwest No. 4	151	151		151	
Southwest No. 3	205	205		205	
Central	301	303		303	
Empire	120	...	120	...	
Brownfield	...	...	...	...	30
Total	1,253	1,123	132	1,123	30

11.—Scottdale-Mt. Pleasant District.

Dexter	40	40		40	
Painter	228	160	68	160	
Bessemer	100	...	100	...	
Southwest No. 2	252	252		252	

Southwest No. 1	625	425	200	425	
Acme	200	262		262	
Buckeye & Hazlett	310	303		303	
Mullen	82	82		82	
Standard	901	901		901	
Total	2,738	2,425	368	2,425	

12.—Sewickley Branch District.

Hester	50	...	50	...	
Boyer	120	120		120	
Veteran	80	60	20	60	
Hecla No. 1	272	272		272	
Hecla No. 3	300	300		300	
Brinkerton	206	240		240	
Mutual	197	197		197	
United	350	350		350	
Humphries	100	100		100	
Marguerite	400	400		400	
Hecla No. 2	500	500		500	
Calumet	260	260		260	
Mammoth No. 1-2	510	510		510	
Claire	50	50		50	
Total	3,395	3,359	70	3,359	

13.—South Latrobe District.

Whyel	...	30		30	
Whitney	352	352		352	
Hostetter	355	355		355	
Baggaley	400	400		400	
Dorothy	230	230		230	
Monastery	208	208		208	
Latrobe	136	136		136	
Mt. Pleasant	...	...		...	200
Total	1,681	1,711		1,711	200

14.—North Latrobe District.

Atlantic No. 2	80	80		80	
Gilson	123	123		123	
Derry No. 3	50	50		50	
Derry No. 2	50	50		50	
Duquesne	157	157		157	
Atlantic No. 1	79	79		79	40
Derry No. 1	224	224		224	
Loyalhanna	136	136		136	
Saxman	80	80		80	
Superior	70	70		70	
Total	1,049	1,049		1,049	40

15.—North Greensburg District.

Jamison No. 1	300	300		300	
Jamison No. 2	400	400		400	
Jamison No. 4	200	200	200	200	100
Donahoe	180	180		180	
Salem	180	180		180	
Carbon	57	57		57	
Total	1,317	1,317	200	1,317	100

16.—Ligonier District.

Colony	100	100		100	
Shenango	...	...		...	100
Total	100	100		100	100

17.—Washington County Coal.

Jones & Laughlin Pgh.	2,000	1,600	400	1,600	
Cokeburg	100	281		281	100
Total	2,100	1,881	400	1,881	100

18.—Greene County.

Millsboro	...	...	...	...	150
Total					150

19.—Monongahela River Coal Transported to Ovens.

Glassport by-prod.	120	120		120	
Midland	...	240		240	
Total	120	360		360	
Grand totals	34,911	40,932	2,538	35,791	2,341

ON THE IRON RANGES.

Duluth, Oct. 27.—The past week has been marked by the visit to the ranges of some of the most prominent mining men of the country on their customary inspection tours. In addition to the local officials who are accompanying the party the United States Steel Corporation is represented by James Gayley, Thomas Morrison, D. M. Clemson and D. G. Kerr.

Mention was made in last week's issue of THE IRON TRADE REVIEW of the sale of the furnace properties of the Cherry Valley Iron Co. to the Inland Steel Co. This deal also includes the transferring of the Brunt mine at Mountain Iron, the entire control of which is held by the Rhodes interests, to the Inland Steel Co. It is also more than probable that the Croxton mine in which the Rhodes Co. had a third interest and the La Rue mine, a tenth of which it controlled, are also concerned in the sale to the above extent. The Inland Steel Co. also owns the Laura mine at Hibbing.

Both the Lincoln and the Leetonia mines of the Interstate Iron Co. have discontinued shipments for the remainder of the season. The Lincoln will mine all winter beginning to stock-pile the ore at once. This year's output at the Lincoln has been largely in excess of last year's, the increase being in the neighborhood of 85,000 tons. The Leetonia mine is an open pit and of course will not be operated again until next spring. A car shortage reduced the shipments from Leetonia by about 40,000 tons. Shipments and mining have also been stopped at the Steel Corporation's Monroe-Tener milling pit, work ending Sept. 20.

The newly remodeled 16-inch mill at the lower plant of the Carnegie Steel Co., Youngstown, O., will soon be ready for operation. Two Belgium furnaces have been built. An electric conveying apparatus will carry the heated billets from the furnaces to the rolls. Other improvements have been added which will greatly increase the tonnage.

HOISTING ENGINE FOR CHAPIN MINE.

The Chapin mine in the heart of the city of Iron Mountain, Mich., and known for many years as one of the largest producers in the Lake Superior region, is to have added to its present equipment a new Allis-Chalmers duplex, single drum hoisting engine of the first motion type, built by the Allis-Chalmers Co., of Milwaukee. The new hoist, which was recently ordered, will have cylinders 34 x 72 inches and will be fitted with Reynolds-Corliss valve gear, with automatic cut-off and governor and with Stephenson link motion. The shaft will carry a composite drum 12 feet in diameter by 10 feet on the face, keyed to the shaft and grooved for 1⅛-inch ropes. The hoist will have a capacity of 26,400 pounds at a speed of 1,900 feet per minute when supplied with steam at a pressure of 125 pounds. The outfit constitutes the third piece of Allis-Chalmers equipment installed in this mine.

KENTUCKY COAL LANDS SOLD.

Portsmouth, O. Oct. 30.—A deal that means much for the central Ohio valley was consummated in Chicago last week, when the controlling interest in the Northern Coal & Coke Co., of Kentucky, was disposed of by J. C. C. Mayo and associates to the Williams & Chisholm interests of Duluth, Minn., the price paid for the interests transferred being in the neighborhood of $4,000,000. The company controlled 300,000 acres of undeveloped coal lands in Knott, Lecher, Pike and Floyd counties, Kentucky, from which it has been planning to build a railroad from the coal fields to the Ohio river at Ashland, Ky., where the Ohio was to be bridged for connections at Ironton with a lake route. The railroad movement was being pressed by Eugene Zimmerman, former president of the C. H. & D., who still owns about one-tenth of the stock of the Northern, and the estimated cost for the 100 miles was $3,500,000. The Duluth parties are iron men and it is presumed that they will carry out the idea of development and the opening up of an extensive coking field.

Construction work on the No. 3 furnace of the Republic Iron & Steel Co. at Haselton, O., is now being rushed night and day, and the furnace will be completed early in next year. The hot metal railway is now working smoothly and the output of the two stacks at Haselton, now in operation, is being conveyed to the mixer at the Bessemer plant of the company in the molten state.

THE IRON MINES AT BIWABIK MINN.

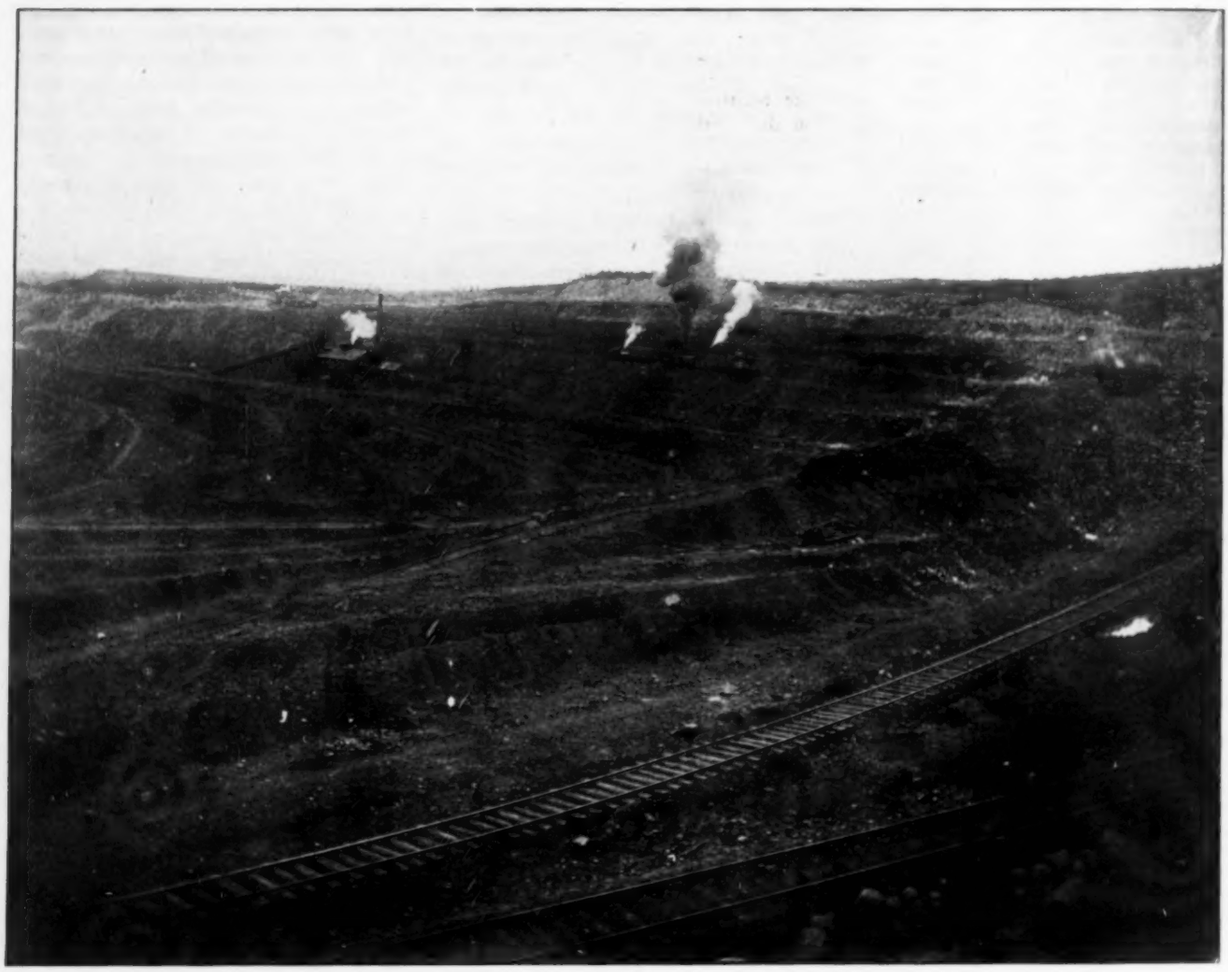
Office of THE IRON TRADE REVIEW.
Duluth October 27.

From Biwabik to Mesabi and the extreme eastern end of the Giants range a newer country than the remainder of the Minnesota mining district is being opened up with a promise of large operations in the near future.

At Biwabik the Biwabik mine of course outdistances all the neighboring properties in the matter of output, size of ore body and cheapness of mining. Beside this mine there are in a row to the north of the town, beginning at the west end, the Holland, Duluth, Williams, Cass, Ajax and Hector mines. In addition to these active mines there is the Canton, which has not been in operation for ten years, and the Cincinnati, one of the greatest disappointments ever presented to buyers as a mine. Directly south of the Holland mine in section 9 township 58 range 16, is the property owned by W. H. Yawkey of New York, and M. L. Fay of the Tesora Mining Co., on which, as already reported, a body of high-grade ore has been shown up and has just been leased to the New York State Steel Co., of Buffalo.

The Holland mine is leased by Swallow & Hopkins of Duluth, and is in charge of Assistant Superintendent F. N. Gleason and Capt. Sampson Menadue. The mine is a part of the Williams estate and is unique in that it was only opened up last year and it is expected will be entirely worked out by the end of this season. With the exception of the Morris pit, the Hull and Myers mines, the first year output of the Holland was the largest ever produced on the range.

When it was drilled the mine gave promise of being a splendid deposit, as the ore is of good quality, but bunches of rock which the drilling did not show up have diminished in large measure the quantity of ore available and have also interfered with its removal. An inclined shaft was put down in the deepest part of the deposit, and a portion of the body opened up from the cave into the deposit in various directions. Some of the underground pillars were subsequently stripped off and the tops of the pillars taken off from above. The digging of the ore is being done by hand. Unfortunately the first shaft was put down in ore and a new incline about 50 feet west of the old one in a part of the pit that has been worked had to be built and has just been finished. The first hoist will be removed or probably has been by this time, and the ore about it mined. The taking out of this ore will not be a very difficult task, it is believed, as the ore is covered with a heavy layer of taconite and it is proposed to put in some blasts and shake down the ore leaving the overburden supported above the hard pan. What little there may be left in pockets will be obtained by drifting into the bank. As mentioned above, the taking out of this ore will not consume more than the remaining two months of the shipping season. Tod, Stambaugh & Co. are the shipping agents for the Holland ore, and most of



EASTERN END OF BIWABIK MINE. GATES CRUSHER IN CENTER AND SHOVEL STRIPPING ON NORTH BANK.

it goes to the Algoma Steel Co., at Sault Ste. Marie.

The Duluth mine, between the Holland and which is the idle Canton property, is also a mine with no very long lease of life in prospect. Two or three years at the most and the Oliver Iron Mining Co. will be through there. The mine has really been in operation only since 1897, though in 1893 about 40,000 tons were taken out, and during that time it has produced 1,186,091 tons. The Duluth, which is for the most part a milling pit, opens out through a narrow neck from the west end of the Biwabik pit. On the north side of the deposit the mining was carried on underground but now the ore is all out and the surface caved in. The mills are along the south bank and are divided by a natural formation into two groups, both of which send their ore to the east shaft. The second shaft is at the west end of the pit and through it is hoisted the ore from the underground workings at that end of the deposit. The mine is shipping about 1,000 tons a day and will get out for the season about 160,000 tons of Bessemer ore. Capt. Wm. Carmaechal has been in charge for nine years.

The Biwabik Mine.

The Biwabik mine is one of the big mines of the Mesabi, and with the exception of the Mahoning pit, probably permits of mining ore more cheaply than at any other place on the range. Like the Mahoning the Biwabik mine is not crowded in the matter of output, and attention is paid to the layout and maintenance of the mine so that it is constantly in a condition for easy and cheap production. The accompanying cut shows a view of the Biwabik pit from the eastern end looking across to the north bank where there is a shovel stripping. This stripping is nearly completed. The buildings in the center of the pit constitute a large Gates crusher and the power plant for operating it. In several places the Biwabik ore is very hard and the crusher was necessary.

The mine is well equipped for handling repairs, having a large shop at the entrance to the mine approach. Two 9 x 12 Ideal engines built by A. L. Ide & Son, Springfield, Ill., furnish power and steam is obtained from boilers manufactured by the Northwestern Steam Boiler Works of Duluth. The boilers in the pit boiler house are of the same make, and the engine for driving the crusher is a 10 x 42 simple Bates-Corliss with band wheel from which the crusher is belt-driven. A Lidgerwood hoist is used for pulling the ore cars up the incline to the crusher, and a crank and fly wheel air compressor built by the McKiernan Drill Co. some time ago, supplies air for the drills.

One of the precautions adopted by Supt. John S. Lutes is to have six shovels in the pit, only three of which are working at any one time. Most of the work was done during the latter part of the summer on the north bank where three shovels were placed, taking cuts on the different benches. Another shovel was located at the west end on the south bank, working away from the west approach, while the other two shovels were at the other end, one in the center of the pit on the bottom level, and one up in the approach. The pit is considerably longer than it is wide and extends east and west. The parallel system of trackage is used. The cars for the shovels on the north bank and for the stripping are moved through the east approach which ascends with a bend to the south out of the extreme eastern end of the pit. The ore from the other parts of the pit is hauled via a switchback on the south bank out through the west approach, which has been cut into the pit almost at right angles near the west end.

The Biwabik mine is held by Tod, Stambaugh & Co., the Youngstown Steel Co. and the Brier Hill Iron & Coal Co. on a lease obtained, strange as it may seem in these days, from the Lake Superior Consolidated Iron Mines by P. H. Kemberly and his associates.

The Williams and Cass mines are both very small properties, the former being controlled by the Thomas Furnace Co. of Milwaukee, and the latter by Joseph Sellwood. The Williams, or as sometimes called the North Cincinnati, has not been operated since 1900, and as a result is badly caved and filled up. Previous to 1900 the mine had only yielded 44,890 tons. This year Claude McKenzie, formerly at the Pettit mine, took hold and is now straightening the mine up preparatory to getting out the remainder of the ore which will not be of any great quantity. The old shaft of the Williams was only 50 feet deep and in July a new shaft 61 feet deep was put down, the difference in depth arising not from the pitch of the ore but from the slope of the surface. Drifts are now being opened up to connect the two shafts and about 150 tons of ore are being shipped daily to the Zenith Furnace at Duluth.

From the Cass mine ore was first taken out in 1903 and last year, when about 60,000 tons were shipped, it made its largest shipment. This quantity will not be materially increased this year.

Some Cincinnati History.

The Cincinnati mine undoubtedly was considered a bona fide proposition by its promoters when the stock was first put upon the market and, in fact, it has yielded about 135,000 tons of iron. But the deposit proved to be nothing but a pocket of ore in a lot of rock and at present the Cincinnati property is under lease to the Biwabik Mining Co., which is using it to build its shops and power plant upon.

East of the Biwabik mine about a mile and on the hill north of Embarass Lake are the Ajax and Hector mines. The Ajax was formerly the Kanawha and the Hector the Hale mine. Both are open pits, forming a continuous excavation. These mines were formerly operated through Joseph Sellwood by Drake, Barlow & Co., of Cleveland, who in mining the Hale first sunk a shaft and took out all the cheap ore underground. The cave was then stripped and the remainder of the easily accessible ore obtained. The mine was then abandoned as it was thought that not enough ore was left to pay for mining. The Kanawha was more nearly worked out and during the idleness of the mine the continuance of the ore body was lost.

Hector Again Shipping.

After the Hector mine was abandoned in 1903, Geo. St. Clair attempted to interest a number of mining men in it but after examination it was condemned. Under the name of Hector Iron Co., Mr. St. Clair, who controls all of the neighboring property as well, began to mine on his own account, last year taking out about 5,000 tons; this year he will ship from 60,000 to 80,000 tons. Morgan H. Wright is the superintendent and Andrew Holler captain, and the ore is being sold through Pickands, Mather & Co. to the Zenith and Thomas furnaces. At present the Hector Iron Co. is taking out ore along the hanging wall on the south side of the old pit and is finding a considerable quantity. The footwall was pretty well cleaned up save for small bunches of ore here and there, to mine which drifts have to be driven into the bank. The ore is of a consistent gritty structure that makes it of excellent characteristics for furnace use, it being possible, it is claimed, to charge a furnace with this ore alone as a burden.

A new shaft is being sunk on the hill at the east end of the pit and it will be 160 feet deep and will be down in 65 feet of ore. Considerable difficulty has been experienced in sinking this shaft as a vein of taconite was encountered, which, because of its soft, crumbling character, made the drill holes hard to hold. To get the ore out of the pit, there was built an inclined hoist, at the bottom of which is a skip hopper. Hand cars into which the ore is also shoveled by hand are run on a trestle over the skip and dumped. At the time this mine was visited the incline was about to be lengthened, going down farther into the ore. This work has been carried on by the present operators since a year ago last February.

"Scarcity" Factors Influence Markets.

Developments of the past week in the stock market were not important. They consisted principally of the continuance and growth of factors which have been exerting considerable influence for some time. With the near approach of the general elections, the outcome in New York is attracting more widespread attention and financial interests are speculating on what the effect of Mr. Hearst's election would be. This is due to the general tendency not to underrate the strength of his candidacy, however, and all indications point to his emphatic defeat. The "scarcity" factor has become one of increasing importance. The labor situation is unimproved throughout the country, the money stringency has still to be reckoned with, and the car shortage has become more acute, its influence being felt in almost every line. Conditions in Russia are still desperate and the winter will be entered with the prospect of extreme suffering from famine. On the other hand, evidences of prosperity are numerous. Large consumers of iron and steel products are planning far ahead for supplies and producers of raw materials are sold well into the future. Trading during the week was comparatively light, with prices fluctuating within a narrow range. The professional trader was in evidence. Secretary Shaw's action in suspending his plan for facilitating gold imports was important, as was his agreement to substitute other than government bonds for the security of government deposits, provided the bonds released were used for taking out additional bank note circulation to be retired within certain limits.

Directors of the Pullman Co. have declared the regular quarterly dividend of two per cent, payable Nov. 15. The Pressed Steel Car Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable Nov. 28. No dividend was declared on common.

The Chicago Pneumatic Tool Co., in the quarter ending Sept. 30, earned net profits of $254,000. Deducting bond interest and $36,000 for depreciation there remained a balance of $126,000 applicable to dividends, which is at the rate of 11.5 per cent for the full year.

Henry C. Frick is quoted as saying, "The prosperity of the country is well known to all. Railroad and industrial earnings show it and the larger business interests believe in the stability of these things for a long time to come. The steel industry, if that can be taken as an indication of what to expect, promises everything."

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quotation Oct. 20	Closing Quo. Oct. 27.	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Pay.
Allis-Chalmers Co	16⅛	17⅛	+ ⅝	Sept.	100	19,820,000	.....	.....	.....
Allis-Chalmers preferred	43	44¾	+1¾		100	16,150,000	7 cum	.....	Feb., 1904
American Can	6¼	6	− ¼	Apr. 24	100	41,233,800	.....	.....	.....
American Can preferred	55	55	.....		100	41,233,300	7 cum	5 Q.	Oct., 1906
American Car and Foundry	43¼	44	+ ¾	June 28	100	30,000,000	.....	.....	May, 1905
AmericanCar and Foundry preferred	100⅜	100⅜	− ⅛		100	30,000,000	7 n. c.	7 Q.	Oct., 1906
American Locomotive	72	74⅛	+2⅛	Oct. 16	100	25,000,000	.....	1¾	Nov., 1906
American Locomotive preferred	112⅛	111	−1⅛		100	24,100,000	7 cum	7 Q.	Oct., 1906
American Shipbuilding	70	69⅞	− ⅛	Oct. 2	100	7,600,000	4 n. c.	1 Q.	Aug. 1906
American Shipbuilding preferred	110	109½	− ½		100	7,900,000	7 n. c.	1¾ Q.	Aug. 1906
American Steel Foundries	10¼	9⅞	− ⅜	Oct. 3	100	17,700,000	.....	.....	.....
American Steel Foundries preferred	44	43¾	− ¼		100	17,700,000	6 cum	.....	Aug., 1905
Barney & Smith	74	70	−4	June 5	100	1,000,000	4	4	Sept., 1906
Barney & Smith preferred	140	140	.....		100	2,500,000	8 cum	8 Q.	Sept., 1906
Bethlehem Steel	17	18	+1	April 3	100	15,000,000	.....	.....	.....
Bethlehem Steel preferred	63⅛	67¼	+3¾		100	15,000,000	7 n. c.	7 Q.	Aug., 1906
Bullock Electric preferred	114	112	−2	Oct. 2	100	1,000,000	6	6 Q.	July, 1906
Cambria Steel	37¼	37½	+ ¼	March 20	50	45,000,000	6	3 Q.	Aug., 1906
Cambria Iron	40	40	.....		50	8,468,000	4	4 S. A.	Oct., 1906
Colorado Fuel & Iron	50¾	51⅛	+ ⅜	Oct. 15	100	30,132,000	7	.....	Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	16	.....	.....	May 31	100	6,098,000	5	.....	Nov., 1902
Crucible Steel	12⅜	11⅜	− ⅜	Oct. 17	100	25,000,000	.....	.....	.....
Crucible Steel preferred	78⅛	77⅜	−1⅛		100	25,000,000	7 cum	.....	Sept., 1906
Empire Steel	8	8	.....	Feb. 28	100	2,281,400	.....	.....	.....
Empire Steel preferred	48	48	.....		100	2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	95	95	.....	Feb. 20	100	1,000,000	6	6 Q.	Aug., 1906
Fay & Egan preferred	128½	128½	.....		100	1,000,000	7 cum	7 Q.	Aug., 1906
General Electric	174½	174	− ⅜	May 8	100	48,256,050	8	8 Q.	Oct., 1906
International Pump	43	44¾	+1¾	June 5	100	12,262,500	.....	2	July, 1905
International Pump preferred	84	81½	−2½		100	8,850,000	6 cum	6 Q.	Nov., 1906
Lackawanna Steel	72	72	.....	March 14	100	34,971,400	.....	.....	.....
Lake Superior Corporation	15½	15⅝	.....	Oct. 3	100	40,000,000	.....	.....	.....
Niles-Bement-Pond	130	130	.....	Feb. 7	100	5,000,000	6	6 Q.	Sept, 1906
Niles-Bement-Pond preferred	105	105	.....		100	2,000,000	6 cum	6 Q.	Aug., 1906
Otis Elevator Co	51	50	−1	March 19	100	6,350,300	2	2 A.	Apr., 1906
Otis Elevator Co. preferred	96	96	.....		100	5,589,500	6 n. c.	6 Q.	Oct., 1906
Pittsburg Coal Co	16½	16¾	+ ¼	Feb. 12	100	30,135,000	7	.....	.....
Pittsburg Coal preferred	57	59	+2		100	30,716,200	.....	.....	Apr., 1905
Pressed Steel Car	53½	54	+ ½	Feb. 21	100	12,500,000	3	.....	Aug., 1904
Pressed Steel Car preferred	98¼	98¾	+ ½		100	12,500,000	7 n. c.	7 Q.	Nov., 1906
Pullman Palace Car	255	261½	+6½	Oct. 18	100	74,000,000	.....	8 Q.	Oct., 1906
Railway Steel Spring	50⅜	52	+1⅝	March 1	100	13,500,000	.....	4 S. A.	Oct., 1906
Railway Steel Spring preferred	100	100	.....		100	13,500,000	7 cum	7 Q.	Sept., 1906
Republic Iron & Steel	35½	36¾	+ ¼	Oct. 17	100	27,352,000	.....	.....	.....
Republic Iron & Steel preferred	96⅜	96⅛	− ⅜		100	20,852,000	7 cum	7 Q.	Oct., 1906
Sloss-Sheffield	72	72	.....	March 14	100	7,500,000	5	5	Oct., 1906
Sloss-Sheffield preferred	106	106	.....		100	6,700,000	7 n. c.	7 Q.	Oct., 1906
Tennessee Coal & Iron	157½	155	−2½	May 15	100	22,552,800	.....	4 Q.	Nov., 1906
U. S. Cast Iron Pipe & Foundry	47½	46¾	− ¾	June 27	100	12,500,000	.....	2	Dec., 1906
U. S. Cast Iron Pipe & Foundry preferred	92	90¾	−1¼		100	12,500,000	7 n. c.	7	Dec., 1906
U. S. Steel	46⅛	47½	+1⅜	April 18	100	508,302,500	2 n. c.	½ Q.	Oct., 1906
U. S. Steel preferred	105¾	106½	+ ¾		100	360,281,100	7 cum	7 Q.	Aug., 1906
U. S. Steel 5's	100¾	100⅞	+ ⅛		100	463,798,000	5	5 A.	
Virginia Iron, Coal & Coke	54	52½	−1½	Sept. 18	100	8,641,600	.....	.....	.....
Westinghouse Electric	154	154	.....	June 27	50	20,996,350	10	10 Q.	Oct., 1906
Westinghouse Air Brake	160	160	.....	Oct. 2	50	10,990,450	30	30 Q.	Oct., 1906

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Hoyt Mining Machinery Co., Los Angeles, has been organized with a capitalization of $1,000,000 to manufacture mining machinery and operate mines. The incorporators are: Fred J. Hoyt, F. W. Hammett and C. E. Davis, of Redlands; Harry Shlauselman, of Pasadena, and H. Highbey, of Los Angeles.

The Atlanta Steel Hoop Co., Atlanta, Ga., is soon to increase its capital stock from $250,000 to $1,000,000.

The Jackson Drop Forge Co., Jackson, Mich., has been incorporated with a capital of $30,000. It is controlled by the Lewis Spring & Axle Co. interests.

The Corrugated Steel Co., Boston, has been organized with a capital stock of $25,000. The officers are: President, Willis H. Jordan, No. 24 Milk street, Boston; treasurer, Frank E. Rowand, Amesbury, Mass.; clerk, Charles F. A. Smith, No. 24 Milk street, Boston, Mass.

The Curtis & Co. Mfg. Co., St. Louis, Mo., is planning to increase its capital stock from $250,000 to $500,000.

The Monarch Iron Works, Plymouth, Ind., have been organized with a capitalization of $50,000 by Alexander T. Stewart, Eugene S. Tascher, Charles A. Johnson, James B. Beattie, Peter J. Dolan, Novitas B. Aspinall and T. Artemus Borton.

The A. G. Southworth Co. has been chartered with a capital stock of $100,000 to manufacture motors, engines, machinery, etc. The incorporators are: John W. Sutton, No. 645 Carroll street; Augustus G. Southworth and Lillian B. Southworth, No. 389 Park Place, all of Brooklyn.

The Whiteside Wheel Co., Indianapolis, Ind., has been incorporated to manufacture and sell metal wheels. The capital stock is $200,000 and the incorporators are: Henry C. Churchman, James Neller and Frank De Long.

The Iron & Steel Store Co., Columbus, O., has been incorporated with an office at the plant of the Columbus Steam Boiler & Heater Co., Bell and Kimball streets. Frank J. Doyle, secretary of the latter concern, is at the head of the new enterprise.

The Worcester Metal Goods Co., having purchased the interests of the Grilley Co., New Haven, Conn., will locate at 17 Hermon street, Worcester. The new company has been organized with a capitalization of $30,000 and the officers are: Arthur Flagg, president; Walter D. Grout, treasurer, and J. Walter Flagg, secretary.

The LeCount & Decker Co. has been incorporated with a capital stock of $10,000 to manufacture engines, boilers, etc. The incorporators are: Philip A. Decker, Jr., No. 319 West 124th street; Philip A. Decker, No. 407 West 123d street, both of New York; and Joseph F. LeCount, Yonkers, N. Y.

The Loraine Mfg. & Tool Co., 115 Dearborn street, Chicago, has recently been organized for the purpose of manufacturing tools and hardware specialties. The company expects to be ready for business within a very short time.

The Gay Machinery Co. has been incorporated with an authorized capital stock of $250,000 to manufacture presses, etc. The incorporators are: Morris D. Koppel, No. 53 Park Row; Rollin E. Doolittle, No. 656 Broadway, both of New York; and Albert E. Lazaro, Hartford, Conn.

The Bergen Iron Works has been organized with a capital stock of $100,000, to manufacture iron work. The incorporators are: Ole M. Knutsen, No. 547 58th street; Carl E. Knutsen, and Martino R Knutsen, No. 539 58th street, all of Brooklyn, N. Y.

New Construction:—

The Red Jacket Mfg. Co., maker of pumps and pump supplies, Davenport, Ia., has awarded the contract for a new foundry to cost about $25,000. The new building will be 80 x 200 feet, adjoining the present foundry, and will double the capacity of the plant. Considerable new equipment will be installed.

I. Levenstein has purchased ground at East Moline, Ill., for a plant to manufacture iron sewer pipe from scrap.

The Standard Foundry Co., Detroit, is to erect an extensive plant between Chene, Guoin and Wight streets.

The C. A. Lawton Co., De Pere, Wis., is preparing to make an addition to its foundry.

The Gunther-Wright Co., Owensboro, Ky., is to erect a new machine shop.

Robert W. Hunt & Co., The Rookery, Chicago, have been appointed consulting, designing and constructing engineers for the new municipal electric lighting plant for the city of Milwaukee, by Chas. J. Poetsch, city engineer. This appointment has been unanimously confirmed by the city council, the site for the plant has been purchased, and work will immediately start upon plans and specifications with an estimated cost of $700,000.

The addition to the plant of the Warren City Boiler Works, Warren, O., will be 135 x 200 feet, with an additional stock runway of about 100 feet. The machinery for this addition has already been purchased.

The Minneapolis, St. Paul & Sault Ste. Marie railroad, Minneapolis, Minn., is having plans prepared for large boiler shops, to be of solid brick and steel construction 206 x 118 feet and to cost $70,000.

The Ajax Metal Co., Philadelphia, Pa., has taken out a permit to erect a one-story brick addition to its foundry on Frankford avenue, to cost $7,000.

The addition to the plant of the Superior Iron Works, Superior, Wis., will be 26 x 45 feet and will be used as an erecting floor. The equipment for this addition has already been purchased.

The Greenville Machine Works, the property of R. M. McDonald, was recently bought out by the Mountain City Foundry & Machine Works, Greenville, S. C.

F. M. McGinty, who is promoting a steel plant at Alliance, O. announces that he has purchased a ten-acre tract of land as a site for the works.

The Silver Mfg. Co., Salem, O., is erecting an addition to its foundry and is installing a new cupola.

The new mill of the Janson Steel & Iron Co., Columbia Pa., is now in successful operation. The company reports business far in advance of its expectations, and as soon as the present force is well organized, the mill will be placed on double turn.

The Robertson Machine Co., Welland, Ont., is contemplating the erection of an extension to its plant, and it is the intention of the company to build early next year two buildings, one 60 x 150 feet and the other 40 x 150 feet, consisting of a foundry, blacksmith shop, machine shop and warehouse.

The Stewart Iron Works Co., Covington, Ky., is erecting an addition to its plant 96 x 223 feet, two stories, of brick and steel. The building will probably be completed by Jan 1, and a large amount of new equipment will be required.

The Block-Pollak Co., East Chicago, is extending its office and is constructing a large machine shop for roll turning. The company contemplates the erection of a new office.

On account of the inability to obtain structural work the Challoner Foundry Co., of Oshkosh, Wis., has postponed until spring the erection if its new steel casting plant.

The W. H. Howell Co., Geneva, Ill., is to enlarge its foundry plant, and work upon the new structure will be begun at once. The cost of the addition and machinery will be about $10,000.

The Ross Gear & Tool Co., La Fayette, Ind., has purchased the Columbia Mfg. Co.'s property and will manufacture the automobile gears invented by David E. Ross. The incorporators are William Ross and D. L. Ross, of La Fayette, and David E. Ross, of Brookston.

The Washburn Co., of Minneapolis, Minn., has purchased the plant of the Menzel Foundry, the consideration being $17,500.

S. L. Allen & Co., Philadelphia, have let the contract for an addition to their machine shop 45 x 79 feet.

An addition 65 x 500 feet will be made to the wire fence factory of Shimer & Co., Anderson, Ind., to provide for increasing business.

The Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, will erect several additions to its foundry on Richmond street, including a building 42 x 73 feet, and one 73 x 96 feet, of steel frame, brick and corrugated iron.

The Vulcan Iron Works, Chicago, has purchased the property at the corner of Irving avenue and Fulton street, where, it is reported, it will erect a new plant.

The Independent Steel & Wire Co., House Building, Pittsburg, Pa., is to install an open-hearth steel plant to contain three 50-ton furnaces. Steel buildings will be erected and the company will need cranes and other equipment.

The Bertelsen & Petersen Co., East Boston, Mass., has prepared plans for two large buildings, including a machine shop 67 x 120 feet, three stories, of brick and steel, and a boiler shop 60 x 200 feet, one story, of corrugated iron and steel. W. O. Webber, mechanical engineer, Exchange building, Boston, is in charge of the plans.

The Reed & Prince Mfg. Co., Worcester, Mass., on account of the inadequacy of its present forge shop, is to erect a new one 50 x 70 feet, one story. Much of the machinery used in the manufacture of its products is built by the concern.

The Garland Nut & Rivet Co., West Pittsburg, Pa., is to begin at once the erection of another large addition to its plant to be used for the manufacture of large bolts and rivets. It will adjoin the new wareroom and will run the entire length of the plant. J. E. Elsesser will have charge of the construction of the new building.

The Federal Machinery Co., Allegheny, Pa., and the Republic Engineering Co., Pittsburg, have been merged and will henceforth be known as the Republic Engineering & Mfg. Co., with general offices on Boquet street, Allegheny. The new company has been organized with a capitalization of $75,000 and will manufacture special mill machinery in addition to doing general casting and machine work. New buildings, consisting of a brass foundry, pattern shop, etc., will be constructed, doubling the present capacity, and will probably be completed about Dec. 1.

The Hettinger Engine Co., Bridgeton, N. J., is in the market for a number of machine tools, a heating plant, lockers, etc., for its new plant, which is 75 x 100 feet, one story. The plant will be devoted to the manufacture of gas and gasoline engines, and work on the construction has been started.

General Industrial Notes:—

The Canada Steam Pump & Machine Co., Toronto, Ont., has absorbed a company by the same name which has been in existence for the past three years. No changes are contemplated for the present, but next year the company intends to increase its capacity both in tools and buildings.

Bradford, Ill., has subscribed $50,000 to secure the location of the new plant of the Draft Gear Mfg. Co., at that place.

The Consolidated Press & Tool Co. is to remove from Chicago to Hastings, Mich., in consideration of a $3,000 bonus.

The Penn Steel Casting & Machine Co., Chester, has closed contracts through Powell & Colne, 11 Broadway, New York, for two two-ton Tropenas converters. The Duquesne Steel Foundry Co., Coraopolis, Pa., is also to install a converter and equipment in the addition to its foundry.

Fires:—

The Linn Iron Works, Birmingham, Ala., were damaged to the extent of $1,400 by fire Oct. 20. The blaze started in the pattern room.

The Southern Scrap & Metal Co., New Orleans, La., sustained a considerable loss Oct. 21, when the building which it occupied was burned.

By an explosion in the mine of the Cambria Steel Co., Johnstown, Pa., Oct. 23, several workmen were killed.

The Union Foundry in Ayer City, near Lowell, Mass., was considerably damaged by fire Oct. 18. Many patterns and tools were destroyed. The loss is estimated to be about $3,000, fully insured.

TRADE PUBLICATIONS.

The Wellman-Seaver-Morgan Co., Cleveland, has issued a pamphlet entitled "Engineering Work," illustrating and describing some of the plants and engineering works designed by this company. Included in the number are the plants of the Atlanta Steel Hoop Co., Atlanta, Ga.; the Buffalo Foundry Co.; the Algoma Steel Co., Sault Ste. Marie; the Wickwire Bros. Co., Cortland; the power plant of the Chicago drainage canal; the water hoist at the Hampton colliery of the D. L. & W. railroad, Scranton, Pa., and numerous others.

The Fisher Machine Works, Chicago, has issued a second edition of its catalog, describing wood working machinery, hangers, pulleys, etc. The machines described and illustrated comprise band saws, stave jointers, slab saws, saw tables, rip saws, cutting off saws, swing saws, surfacers, planers, gluing machines, hand hole cutters, boring machines, etc.

The United States Steel Piling Co., Chicago, illustrates sectional steel piling in a recently issued catalog. The piling is formed of interlocking sections, ranging in weight from 40 pounds per foot to 11 pounds per foot, made in various shapes for different services. It is stated to be adaptable to all uses to which piling may be applied and is water tight.

The Western Tool & Mfg. Co., Springfield, O., is distributing a booklet descriptive of lathe, planer and shaper tools. It is devoted principally to inserted cutter tools, though others are listed, including reamers, dogs, clamps, files, vises, etc.

The Union Steam Pump Co., Battle Creek, Mich., is distributing a catalog describing Burnham steam and power pumps for all duties. The catalog comprises 48 pages, chiefly illustrations.

The Wisconsin Engine Co., Corliss, Wis., is distributing a catalog describing Corliss engines. The catalog comprises over 50 pages, the greater number of which are devoted to illustrations of completed engines and parts of engines, covering a large range of sizes and services. Statistical information regarding the engines is given by means of a number of tables which are used in connection with line drawings accompanying them.

The Case Mfg. Co., Columbus, O., is distributing bulletin No. 22, describing electric cranes. It comprises 30 pages, well illustrated with half tones of completed cranes and the various parts, together with photographs of several installations.